MONGOLIA,

THE TANGUT COUNTRY,

AND THE

SOLITUDES OF NORTHERN TIBET

BEING A

Narrative of Three Years' Travel in Eastern High Asia.

BY

LIEUT.-COLONEL N. PREJEVALSKY,

OF THE RUSSIAN STAFF CORPS: MEM. OF THE IMP. RUSS. GEOG. SOC.

TRANSLATED BY

E. DELMAR MORGAN, F.R.G.S.

WITH INTRODUCTION AND NOTES BY

COLONEL HENRY YULE, C.B.

LATE OF THE ROYAL ENGINEERS (BENGAL).

IN TWO VOLUMES—VOL. II.

With Maps and Illustrations.

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ON the morning of October 27th we left the town of Din-yuan-ing (Wei-tching-pu) on our return journey to Kalgan. The eve of our departure we passed with our friends, the Gigen and Siya, who took leave of us with unfeigned sorrow, and invited us to return as soon as possible. We gave them our photographs, and assured them that we would never forget the kindness we had received in Ala-shan. Just as we were on the point of starting the Lama Sordji and another official made their appearance, to bid us a last good-bye from the sons of the prince, and to escort us out of the town.

We had now a long and difficult journey before us, the distance from Din-yuan-ing to Kalgan (through Mongolia) being reckoned about 800 miles, which we had to perform without a break. Meanwhile the approach of winter was heralded by sharp frosts and winds, prevalent in Mongolia at this season of the year. To make matters worse my travelling companion, Michail Alexandrovitch Pyltseff, fell ill with typhoid fever soon after we left Din-yuan-ing, a circumstance which detained us nine days, near the spring of Kara-moriteh in the northern part of Ala-shan.

The state of my companion's health was rendered more critical owing to the want of medical assistance, for although we had a few drugs with us I had not sufficient confidence in my skill as a practitioner to administer them. Happily his youth pulled him through, and Michail Alexandrovitch, in spite of continued weakness, was able to sit on a horse, although he fell off more than once in a fainting fit. However, we hurried on, marching from sunrise to sunset every day.

Desirous of becoming acquainted with the country on the left bank of the Yellow River, and the mountains which border this part of the valley, I determined on crossing the country of the Urutes, which is conterminous with Ala-shan. In the northern part of the latter region, 63 miles from Din-yuan-ing, we came to an immense lake-bed of sedimentary salt, called by the Mongols *Djaratai-dabas.* This lake-bed occupies the lowest part of the whole of

Ala-shan, and is 3,100 feet above the sea; it is about 33 miles in circumference, and encrusted with a layer of pure salt 2 to 6 feet thick. It is remarkable that this natural production should be so little utilised; only a few dozen Mongols being engaged in the industry of digging the salt out and carrying it on camels to the Chinese towns of Ning-hia-fu and Bautu.[1]

The salt is obtained in the following way: first a thin covering of dust is removed from the surface, the salt is then dug out with iron spades and washed in the water which collects in the excavated holes. It is then poured into bags, and laden on camels, each camel carrying a load of about 3½ cwt. A payment of 50 chokhs,[2] or about *2d.*, is levied on the spot on each camel load, and the same amount is charged for the labour of getting it. A Mongol officer lives at Djaratai-dabas, to inspect the salt industry and receive the income arising from it, which is paid into the treasury of the prince. The latter also earns large sums by his camels, which are hired for the transport of the salt; nine-tenths of the profits realised are given up to him, leaving only one-tenth to the carrier. The Mongols said that a camel load of salt fetches 1½ to 2 lans, *7s. 6d.* to 10*s*., at Bautu.

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[1] Huc gives a vivid description of a lake-bed of the same kind in the Ordos country, under the name of *Dabsoun-Núr*, or Salt Lake (i. 329–331).—Y.

[2] *Chokh* or *chek*, said by Timkowski to be a corruption of a Mongol term *jos*, is the name which the Russians give to what we call Chinese *cash*, properly *t'sien*, those copper coins with a hole in the middle which are strung on strings. The old normal equation was one string or 1,000 *t'sien* = 1 *liang* (lan of the text) or ounce of silver, but now the number varies and is always much more than 1,000. The calculations in the text seem to reckon 1,500 cash to the *liang*.—Y.

The environs of this lake are almost devoid of vegetation, and present a desolate aspect, particularly in summer, when the heat is so intense as to put a stop for a time to the salt industry.

The sparkling surface of Djaratai-dabas appears like water in the distance, and resembles ice when you are near it. So deceptive is its appearance that a flock of swans, apparently attracted by the sight of water in the desert, descended before our very eyes almost to the surface of the false lake, but discovering their mistake rose again in the air with affrighted cry, and continued their flight.

In the north of Ala-shan, not far from the well of Moriteh, where we halted in consequence of the illness of M. Pyltseff, there rises from the plain a comparatively small but rugged group of mountains, the Khan-ula or Haldzyn-burgontu, forming the last elbow of the border range on the left bank of the Hoang-ho. This range, known to the Mongols as the Kara-narin-ula[1] (black pointed mountains), begins at the Haliutai River, and continuing in a south-westerly direction for about 200 miles as far as the northern boundary of Ala-shan, terminates in some low rocky hills rising from the sandy plain; its southern branches, which attain a considerable height at Khan-ula, but soon diminish in size, alone extending a short distance beyond Djaratai-dabas.

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[1] These mountains are not generally known by this name, which we only heard applied to them by some lamas.

Towards the east the Kara-narin-ula is connected by low and perhaps interrupted ridges of hills with the Sheiten-ula and therefore with the In-shan; on the south it is separated from the Ala-shan mountains by sandy wastes upwards of 60 miles in extent.

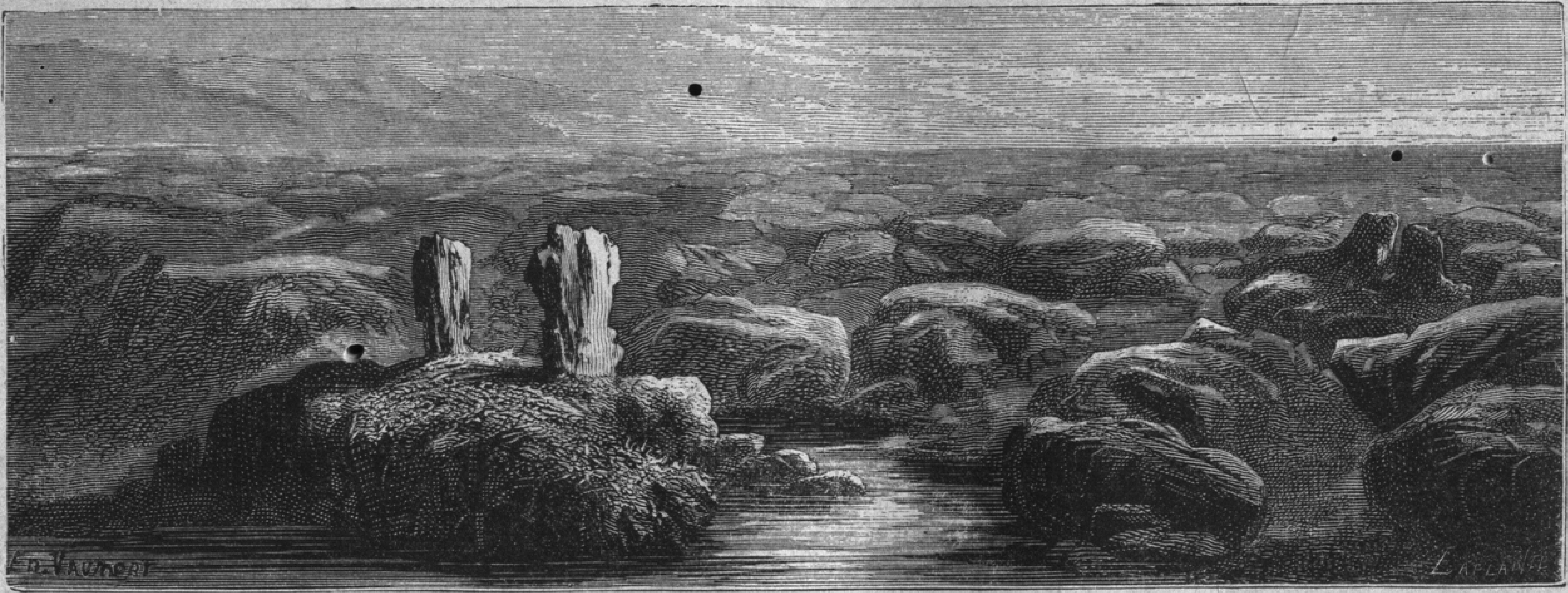
Like the mountains near Kalgan, the Kara-narin-ula serves as a border range, i.e. it forms the girdling rampart of the elevated Gobi, separating it from the lower valley of the Hoang-ho; the difference between the level of the country lying east and west of it amounting to 2,400 feet. From the valley of the river it presents the appearance of a steep wall, intersected by occasional narrow defiles. Its greatest height is in the middle; but along its whole extent it is wild and barren. Enormous crags of granite, hornblende, gneiss, felspathic porphyry, syenite, felspar, limestone, and clayey schist furrow the sides of these mountains and crown many of their peaks, whilst great blocks of the minerals become detached from the rocks by a natural process of disintegration, and roll down to the bottom of the ravines. Here and there a shrub of the wild peach, or a scanty elm, clings to the mountain side, but otherwise there is very little vegetation of any kind. Nevertheless, animals abound here; numbers of kuku-yamans haunt the rocks, and the argali inhabits the western slopes where the outline of the hills is softer. The peculiarity of this range is the abundance of its springs and watercourses, notwithstanding the entire absence of trees.

From Khan-ula we had the choice of two routes

—one by the valley of the Hoang-ho along the foot of the range which borders it, and the other by the western side of the same mountains, i.e. over the highlands of the country of the Urutes. I chose the latter road in order to acquaint myself with the character of this part of the Gobi plateau.

We ascended gradually some of the low outlying hills of the chain which, as we have remarked, are much lower than the rest. The appearance of the plateau at first, with its sterility and naked sands, reminded us of the desert of Ala-shan. Vegetation is very scanty; the wild wormwood and prickly convolvulus being the chief kinds. But as we advanced to the north-west the soil improved, and at length, 80 miles beyond the boundary of Ala-shan, it became clayey or clay mixed with shingle, and was covered with short steppe grass. Here we at once found those denizens of the Mongol steppes — the dzerens, which are not met with in the whole of Ala-shan.

On ascending the plateau the climate rapidly changed. The autumn weather during the whole of October in the plains of Ala-shan was delightful, and the temperature so warm that even in the second half of this month at mid-day the thermometer marked 12·5° Cent. (54° Fahr.) in the shade, and on the 6th of November the surface of the sand was heated to 43·5° Cent. (109° Fahr.); the night frosts were never severe, and the thermometer did not fall below − 7·5° Cent. (20° Fahr.)


Ch. Vaumort
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THE GOBI PLATEAU.

But no sooner had we crossed the Kara-narin-ula mountains than excessive cold weather set in; and on the 15th November we experienced a storm which reminded us of the climate of Siberia a month later. With a violent gale from the NW. and a temperature of – 9·0° Cent. (17° Fahr.), the sleet continued the whole day; the snow flakes, driven by the force of the wind into the finest particles, were mingled with clouds of sand which completely enveloped us. Large objects, ten paces off, were invisible; and we could neither open our eyes nor breathe freely when facing the wind. It was useless attempting to pursue our journey under these circumstances, and we remained in our tent, occasionally issuing forth to clear away the snow and sand-drifts which blocked up the entrance to our humble abode. Towards evening the violence of the snow-storm increased so much that we were obliged to leave our camels out all night, only securing them the following day.

The snow lay on the ground several inches deep, forming great drifts in places, and hard frosts continued every day. This unfavourable weather added greatly to the difficulties of our journey, and aggravated the sufferings of my sick companion. The beasts also suffered a good deal from want of food. Two of our camels and one horse soon refused to move, and had to be abandoned, their places being taken by the spare camels which we had got in Ala-shan.

In this way we advanced for 100 miles along the western side of the Kara-narin-ula. At length, after satisfying ourselves that this range does not throw out lateral spurs into the centre of the plateau, which it borders, we crossed to the other side by the defile of the river Ugyn-gol, and on November 11th descended into the valley of the Yellow River. Here we passed suddenly from winter into mild autumnal weather, such as we had left behind us in Ala-shan. Not a particle of snow lay on the ground, and the thermometer, which on the uplands stood below zero at noon, now often rose above the freezing point. This change in the temperature occurred in an extent of only thirteen miles of country covered by the border range.

Winter, however, soon began to make itself felt also in the valley of the Hoang-ho. The water was covered with ice, and the morning frosts rapidly increased in intensity. The mercury fell to −26·0° Cent. (−14° Fahr.) at sunrise, but during the day it was warm, especially in calm weather; the sky was almost always clear.

We saw no inhabitants on the western side of the Kara-narin-ula. All the Mongols had fled to the valley of the Hoang-ho, alarmed at the appearance of a small band of brigands who came from the environs of Lake Koko-nor. Such incursions were not unfrequent in those parts of Mongolia which lay on the borders of the districts disturbed by the Dungan rebellion. The bands of robbers which continually made their appearance in these districts were composed of all kinds of vagabonds armed with pikes or swords, and in a few instances with matchlocks. Yet, notwithstanding their inferior weapons, they produced a panic among the Mongols and Chinese, who took to their heels and ran as fast as ever they could at the mere name of a Dungan. While we were at Din-yuan-ing, the Prince of Ala-shan, who was preparing to despatch an armed force against the marauders, sent an official to ask us for the loan of our military caps to frighten the enemy. 'The brigands are well aware,' said the official, 'that you are here, and if they see your caps, which we will put on, they will imagine that you are with us, and will run away directly.' This incident serves to show what dread is inspired by even the name of Europeans, and how the people of Asia instinctively acknowledge our moral superiority over their degenerate character.

In Chapter IV. of this volume I will describe more fully the military operations of the Mahommedan insurgents and Chinese forces; suffice it for the present to remark, that the Dungans are not a whit braver than their opponents, and are terrible only to Chinese and Mongols. Strange as it may sound, it is none the less a fact that, in the districts which were liable to these robber raids, we travelled with more ease and security than anywhere else; and that for the simple reason that they had no population! We were convinced (and the belief was confirmed by all the experience of our later wanderings) that these cowardly marauders, even if several hundred strong, would never dare to attack four Europeans armed to the teeth; and if in a moment of unusual audacity they had ventured on so rash a proceeding, our guns and revolvers would have taught them a good lesson. On the other hand, when travelling through populous districts, we were constantly exposed to all kinds of insults, against which there was no possible defence. Although our Peking Foreign Office passport set forth that in case of need help should be given us, this was a mere formula, and was of no practical advantage; we really experienced nothing but hostility from the Chinese, and their local authorities were always delighted at any inconvenience and annoyance that befell us. Our visits to the towns of Bautu and Ding-hu were marked by such scenes as could never have occurred had the Chinese functionaries been better disposed towards us. In proof of this assertion I will presently relate an accident which befell us in the earlier part of December. But now let us return to our narrative.

The valley of the left bank of the Hoang-ho at its northern bend presents a grassy aspect like that of the right bank. The clayey soil is covered with thick clumps of the high *dirisun* grass; beside the river there is a growth of bushes; whilst nearer the mountains the surface of the plain becomes shingly. The absolute height of this country, like Ordos, does not exceed 3,500 feet. The Chinese population is dense, particularly nearer the river, while at the foot of the mountains are the habitations of Mongols who have fled hither from the uplands and from Ordos. Chinese soldiery are quartered in the villages as a protection against Dungans. In the district between the towns of Ning-hia-fu and Bautu the number of these troops is estimated at seventy thousand, although numerous desertions are said to have diminished this army to one-half of its nominal strength. The soldiers are so demoralised that they do nothing but plunder the inhabitants, who look upon them as terrible scourges. The Mongols often told us that they had more cause to dread the presence of their defenders, the Chinese soldiers, than that of the Dungans, because the latter 'robbed them once for all, and had done with it, but the soldiery kept continually looting.'

Even we had some disagreeable encounters with the Chinese soldiers. Once they tried to take possession of our camels; on another occasion two soldiers ordered us to draw water out of a well for their horses. But the rascals were punished as they deserved, and left us somewhat crestfallen.

Near the mountains we saw the old channel of the Hoang-ho (Ulan-khatun), which is 1,190 feet wide, and very distinctly discernible, although completely dry and grass-grown. The Mongols told us that this desiccated river-bed separated from the present Hoang-ho at the point where the sand-drifts of Ordos crossed into Ala-shan; the old channel passes close to the mountains for a considerable distance, then taking a sharp turn it unites with the present river near the western extremity of the Munni-ula.

There are two lesser arms between the former and present channels of the Hoang-ho which dry up during the hot weather, but are full of water at flood-time. Besides the main river and its channels, there is no water in the valley, except in wells, which are invariably very deep. The streams which rise in the border range disappear immediately in the soil, not one of them flowing as far as the Hoang-ho.

We found several wintering kinds of birds in the valley, viz. *Falco tinnunculus*, *Circus* sp.? *Plectrophanes lapponica*, *Otis tarda*, *Coturnix muta*, *Anas rutila*, and innumerable pheasants (*Phasianus torquatus*). The latter haunt the long grass called *dirisun*, and owing to the absence of water come to drink at the wells, where they may be shot in any numbers from a place of ambush. I preferred, however, shooting them with my setter, Faust, and the first day bagged twenty-five, besides losing some wounded birds, which were difficult to find owing to the length of the grass, and the pace at which they run.

When the nature of the valley of the Hoang-ho became steppe-like, kara-sultas and dzerens appeared in numbers, and every day's sport included some of these animals, which replenished our supplies of provisions. However, the favourite delicacy of the Mongol whom we hired at Ala-shan, as well as of our Cossacks, was brick tea, which they consumed in inordinate quantities, especially when milk was procurable, which, to use an expression of the Cossacks, 'whitened' the tea and gave it a dainty relish. A bucketful of this nectar was the usual allowance. This tea-drinking was a great nuisance to us, particularly when we were in a hurry to proceed on our journey; but nothing would induce either Mongol or Cossacks to stir till they had boiled their tea and refreshed themselves with long draughts of this beverage. Finding that the spirits of the party often depended on the consumption of tea, particularly of the whitened kind, I made up my mind to submit to it.

Our route in the valley of the Hoang-ho skirted the border range which extended as an uninterrupted wall as far as the river Haliutai. Here the mountains suddenly become much lower, in fact are no higher than hillocks, and retreat to one side of the abrupt cliff which continues to define the valley of the river. These hillocks serve as connecting links between the mountains on the border and the Sheiten-ula chain, which extends eastwards as far as the river Kunduling-gol. The latter is a low but rocky and treeless range, as far as we could see very deficient in water.

Almost on the meridian of the western termination of the Sheiten-ula rise the westernmost spurs of the Munni-ula. Between these two chains of mountains lies the broad valley of the Hoang-ho, thickly populated by Chinese. A belt of sand-drifts here prepares the traveller coming from the east for the frightful deserts of Ordos and Ala-shan.

At the Kunduling-gol we rejoined the track of our outward journey, so that from this point forward we had the benefit of a map and travelled no longer at haphazard. Moreover, no further surveys were necessary, and the labours of the expedition were consequently lightened. This relieved us of very troublesome work; and indeed surveying in winter is so arduous that I got two fingers on each of my hands frostbitten whilst working with the compass.

Early in December we left the valley of the Yellow River, and ascended by the Shohoin-daban to the more elevated border of the plateau, where we again experienced severe cold. The thermometer at sunrise descended to −32·7° Cent. (−26° Fahr.); and the frost was often accompanied by strong winds and sleet. All this happened in the very place where in summer we had 37° Cent. (98° Fahr.) of heat. Thus the traveller in Central Asia must endure scorching heat and Siberian cold, and should be prepared for sudden changes from one extreme to the other.

My companion, still weak and shaken in health, was obliged to sit on horseback day after day, wrapt in a sheepskin cloak. We, who usually went on foot, did not feel the cold so much whilst on the march; but in camp the severity of the winter was felt by us all with a vengeance. How well I remember the purple glow of the setting sun in the west, and the cold blue shades of night stealing over the eastern sky. We would then unload our camels and pitch our tent, after first clearing away the snow, which was certainly not deep although dry and fine as dust. Then came the very important question of fuel, and one of the Cossacks usually rode forward to the nearest Mongol yurta to buy argols if we had not already laid in a supply. We paid a high price for the argols, but this was a lesser ill; how much worse was it when they refused to sell them to us, as the Chinese often did! Once, at our wits' end for fuel, we were obliged to cut up a saddle in order to boil a little tea, and had to content ourselves with this frugal supper after a march of 23 miles in severe cold and snow-storm!

When a fire was lighted inside our tent the warmth was sufficient at all events for that part of the body which was immediately turned towards the hearth; but the smoke irritated the eyes, and when aggravated by dust became almost unbearable. In winter the steam from the open soup-kettle completely filled our tent, reminding us of a Russian bath, only that of course the temperature was very different. Boiled meat became quite cold before we had time to eat it, and the hands and mouth were covered with a layer of grease which had to be scraped off with a knife. And in the stearine candle that lighted us at supper-time, the part close to the wick would burn down so low, that we had from time to time to break off the outer shell, which remained unaffected by the flame.

For the night we piled round the tent all the packs and closed the entrance as tightly as possible, but notwithstanding all these precautions the temperature inside our dwelling was very little warmer than out of doors, as we kept up no fire after supper-time until morning. We all slept under fur cloaks or sheepskin coverings, generally undressing to sleep more comfortably. While asleep we were warm enough, because our whole bodies, head and all, were under the coverings, and we sometimes added felts over all. My companion slept with Faust, and was very glad of such a bedfellow. Hardly a night passed quietly. Prowling wolves often frightened our camels and horses, and the Mongol or Chinese dogs would occasionally enter the tent to steal meat, generally paying the penalty of their lives for such unceremonious behaviour After such an episode, how long it was before he whose turn it had been to quiet the startled camels, or to shoot the wolf or thieving dog, could get his blood a little warm again !

In the morning we all rose together, and shivering with cold, made haste to boil some brick tea then we folded the tent, loaded the camels, and a sunrise continued our journey in the sharp frosty air

One would have expected that in returning by the same road we had come we should have avoided many accidents, and might have reckoned beforehand the length of our marches, but in this we were deceived; one more misadventure had yet to be encountered. This occurred in the following way: Late in the evening of the 12th December, we halted for the night at the temple of Shireti-tsu, 53 miles to the north of Kuku-khoto, on the high road from that town to Uliassutai. The following morning all our camels, seven in number exclusive of a sick one, were allowed to graze near the tent not far from some camels belonging to other caravans which were on their way from Kuku-khoto. Just at this place the steppe grass was entirely trodden down; our beasts therefore crossed a little hill a short distance off to find some better food and seek shelter from the wind, which had been blowing in gusts for five days without intermission. After a little while a Cossack and our Mongol started to drive back to the tent the strayed camels, but they had disappeared from the hillock, and their tracks, partly obliterated by the wind, were undistinguishable from those of other camels. As soon as I heard of their disappearance, I despatched the same men in search of them; they were absent the whole day inspecting the camels of all the caravans in the neighbourhood, but not a vestige could be seen or heard of the animals, which were as completely lost as though they had been swallowed up by the earth. Early the following morning I sent my Cossack interpreter to the monastery of Shireti-tsu, on the land of which we had sustained the loss, to give notice of the theft and ask assistance in finding the missing camels. Our messenger was very reluctantly admitted into the monastery, where the lamas, after examining our Peking passport in which it is mentioned that assistance is to be given when needed, coolly remarked, 'We are not the guardians of your camels; seek them yourselves as best you can.' A similar reply was given by the Mongol official, to whom we likewise applied for aid. Meanwhile the Chinese refused to sell us straw to feed our only remaining sick camel and two horses, whilst the steppe grass was so trodden under foot by the camels belonging to passing caravans as to afford no fodder whatever. Our poor beasts were dying of starvation, and one of the horses was frozen to death at night; the sick camel expired two days afterwards, and lay directly in front of the entrance of our tent, completing the picture of our misery. We were now left with only one horse, which could hardly move its legs. This beast was only saved from starvation owing to the fancy the Chinese took for satisfying their dainty appetites with our dead camel, which was tolerably fat, and which we exchanged for twenty-five trusses of good hay.

The Mongol and Cossack were sent off a second time in search of the missing animals, but returned after a few days, and declared that they had ridden a great distance and made many enquiries, but could learn nothing of the lost camels. Of course it was impossible to find them without the assistance of the local officials. I therefore decided on hiring some of the neighbouring Chinese to convey us to Kuku-khoto, whence we hoped to find means of conveyance to Kalgan. The Chinese however, notwithstanding their mercenary natures, were not tempted by the offer of a large sum of money, and would not agree to be our carriers at any price, fearing, of course, the responsibility which they might incur towards their authorities.

Our position now seemed a desperate one. Fortunately at this time we had two hundred lans in cash (50*l*.), left over from the amount realised by the sale of our merchandise and guns at Ala-shan. I therefore resolved to send the Cossack with the Mongol to Kuku-khoto to buy fresh camels. But the question was, how were they to go, as we had only one horse left, and even that was unfit for use? First then I started with the Cossack interpreter to try and buy a horse at some Mongol quarter. After walking the whole day, we succeeded in purchasing one, and the following morning the Cossack and Mongol started for Kuku-khoto. There they bought new, but very inferior, camels, and these at last enabled us to continue our journey, after a detention of seventeen days at Shireti-tsu. Thus, besides the loss of time, we sustained a very considerable loss in money also. Several of our animals had perished before this, owing to want of food and water, heat, frost—in fact from the difficulties of the route. In the first year of the expedition we lost, altogether, twelve camels and eleven horses; most of the latter however were exchanged with the Mongols for better animals, of course with considerable additional payment.

During this long detention, caused by the loss of our camels, we had hardly any occupation, and there were no birds of any kind except larks and sand-grouse. Writing was also out of the question, because, in the first place, there was nothing to record, and secondly, because it is no such easy matter to write in winter out of doors; you must first thaw the frozen ink, and hold your pen frequently to the fire while writing to prevent the ink in it from congealing. And I always preferred writing my journal in ink, only using a pencil in extreme cases—the latter rubs out so easily and becomes illegible.

Every day caravans passed us on their way from Inner Mongolia, Uliassutai, and Kobdo to Koko-nor. They carried leather and wool to barter with the Chinese for millet, tea, tobacco, flour, cotton yarn, and other articles of domestic use. With the exception of tea, all the other articles might be supplied by the Russians if our commercial relations with Mongolia were more extensive. Kobdo, Uliassutai and Urga, the chief places in the north and the richest part of the country, are almost adjacent to our Siberian frontier, and yet all the imports to these towns are derived from China, and it is to China that the inhabitants go to make their purchases, travelling thousands of miles across the desert and passing months on the way.

On fine calm days I went after dzerens, which were plentiful at a distance of three miles from camp. At that time the dzerens were attacked by an epidemic producing great weakness, soon followed by death. Numbers of their dead bodies strewed the steppe, where they were devoured by crows and wolves, and were also collected for food by the Chinese, who came from Kuku-khoto for this purpose.

Although we were not on the best of terms with the inhabitants, whose character we thoroughly understood by this time, Mongol visitors would often drop in. On one of these occasions our guests stole our last axe and hammer, trifling but indispensable articles for our journey. No others could be obtained, and it was useless attempting to recover the stolen ones. We therefore substituted a hand-saw for the axe, and in the place of a hammer we made use of a big stone, which we carried with us and used every day to drive the iron tent pegs into the frozen ground.

As soon as we had obtained new camels, we hurried to Kalgan by forced marches, only stopping for two days in the Suma-hada mountains to hunt the argali; this time I succeeded in bagging two old rams. Another accident happened to us on the road. My friend's horse took fright, shied, and ran away. Michail Alexandrovitch was too weak to keep his seat on horseback, and fell head foremost on the frozen ground, so heavily that we picked him up insensible. However, he soon came to himself, only suffering a slight contusion.

The influence of the warmth of China on this border land of Mongolia was very remarkable; on calm days or with gentle south-westerly winds it was quite warm during the day. On the 10th December the thermometer marked 2·5° Cent. (35° Fahr.) in the shade. But no sooner did a westerly or north-westerly wind spring up than it became cold. The night frosts were generally moderate; the thermometer at sunrise did not descend below −29·7° Cent. (−20° Fahr.), but after a cloudy night it only registered −6·5° Cent. (20° Fahr.). The weather was generally clear. Snow only fell three times during the whole of December, covering the ground in places several inches thick, although many parts remained quite bare of snow.

The icy winds of Siberia, the almost constantly unclouded sky, the bare saline soil, and its great altitude above the sea, combine to make the Gobi or desert of Mongolia one of the coldest countries in the whole of Asia. But though even here, on the Mongolian border adjoining China, the great elevation of the plateau of course affects the temperature, the climate is far less severe than in remoter parts of the Gobi, and only on rare occasions are the extreme rigours of its winter experienced.

Every day's journey diminished the distance which separated us from Kalgan, and increased our impatience to gain that town. At last the long-wished-for moment arrived, and at a late hour on New Year's Eve (12th January) 1872, we appeared before our Kalgan fellow-countrymen, who received us as hospitably as before.

The first act of the expedition was ended. The results of our journey, which had been so gradually collected, now became plainer. We could say with clear consciences that so far we had fulfilled our task; and this amount of success only whetted our passionate desire to plunge once again into the heart of Asia, and strive to reach the distant shores of Lake Koko-nor.

CHAPTER II.

RETURN TO ALA-SHAN.

Start for Peking—Packing collections—New outfit; rifles; revolvers—Merchandise—Fresh Cossacks—Trial of guns—Effect on the inhabitants—Mongol dog 'Karza'—Water barrels—Departure from Kalgan—Late spring—Migration of birds—To the Munni-ula—Spring vegetation—Leave for the Hoang-ho—Rice fields—Shooting carp—Unattractive valley—Sandy borders of Ala-shan and its vegetation—Inanimate nature—Envoys from the prince—Arrival at Din-yuan-ing—The Czar's officer—Trafficking—Favourable opportunity to proceed—Prince opposes our departure—Intrigues of Sordji—Want of funds—Sale of guns and merchandise—Fortune befriends us—Preparations for a start—Departure of caravan—Detention—Siya's promise—Disappointment—Anxiety—Siya again—Good news—We join caravan—Our travelling companions—Lama-warriors—Randzemba—His passion for the chase—With the caravan—Poisoned wells—Great fatigue—Inquisitive visitors—Pursuit of science under difficulties—Tingeri sands—Mountains of Kan-su—Snowy peaks—Cultivation—Great Wall of China—Town of Ta-jing—Watch towers—White bread—Choice of routes.

A FEW days after my return to Kalgan I started for Peking, to obtain fresh supplies of money and make preparations for a new journey. My companion remained at Kalgan with the Cossacks to lay in a store of different small articles required for the expedition and buy camels, those we had obtained at Kuku-khoto having turned out worthless.

Two months, January and February, quickly glided past in the bustle of preparation, packing and despatching our collections to Kiakhta, and writing reports of our last year's explorations. We were as straitened as ever in our finances, the sum assigned for the use of the expedition in 1872 not having been received in full at Peking. But this difficulty was happily arranged, thanks to the renewed kindness of General Vlangali, who again lent me the necessary moneys, amounting to even more than the anticipated receipts of the current year. The General also procured from the Chinese Government a passport to enable us to travel in Kan-su, Koko-nor, and Tibet. The Government, however, officially notified that, owing to the disturbed state of these countries, travelling in them was attended by considerable danger, and they would in no case be responsible for our safety.

To provide for any emergency which might arise, I determined to increase the number of our guns, which, as we have already seen, are the best defence a European can have in travelling through those parts of Asia which are inhabited by a treacherous and cowardly set of thieves.

At Peking and at Tien-tsin I soon obtained several breech-loaders and revolvers. The best of my new guns was a rifle by Berdan, carrying a bullet at point-blank range upwards of 400 paces, a quality of the greatest importance in firing at unmeasured distances. This gun I reserved for my own use. My companion and one of the Cossacks each took a Snider, and the other Cossack a Martini-Henry with ourselves with 4,000 prepared cartridges for these guns; besides which we had 13 revolvers, 2 Remington pistols, a double-barrelled Lancaster rifle, and four shot-guns, for which we carried 2½ cwt. of shot and ½ cwt. of gunpowder.

These constituted our fighting and sporting equipment. In every other respect we were obliged to stint ourselves as far as possible, owing to our limited means. To cover some of the expenses of outfit and provide for the continuation of our journey, I travelled to Tien-tsin,[1] where I bought sundry small merchandise to the amount of 80*l.*, which I hoped to sell at a good profit at Ala-shan. After all these purchases had been completed, we had only 87 lans (about 22*l.*) left in our pockets at the time of our departure from Kalgan.

The *personnel* of our expedition was now re-organised. The two Cossacks who had accompanied us during the first year proved to be untrustworthy, and suffered so dreadfully from home-sickness that I determined to dismiss them and procure others instead. My two new travelling companions were selected from the detachment stationed at Urga, and, fortunately for us, proved most devoted, efficient, and zealous coadjutors during the whole of our long journey. One was a Russian youth, aged 19, named Pamphile Chebayeff, the other a Buriat, Dondok Irinchinoff. We soon struck up a close friendship with these good men, which eminently conduced to the success of the expedition. Separated as we were from our own country, in the midst of foreigners, we lived like brothers, sharing alike hardships and dangers, joys and sorrows. Can I ever forget the companions whose fearless courage and devotion to the cause contributed so powerfully to ensure our ultimate success? . . .

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[1] Tien-tsin is a little over 66 miles in an easterly direction from Peking; and is situated near the mouth of the Peiho, by which river seagoing steamers of a moderate size ascend as far as that town.

As soon as the new Cossacks arrived at Kalgan, I divided between them the rifles and revolvers, and daily practised them in their use. Before starting on our journey we went through the manœuvres for repelling a false attack; for this purpose we fixed a target at a distance of 300 paces, and all fired as rapidly as possible. The results were brilliant: it was struck all over with our shot; and on another nearer mark the small bullets from the revolvers rained like a shower of peas. The Chinese collected in crowds to witness the sight, never before having seen breech-loaders, and only shook their heads as they looked on at the tricks of the 'foreign devils,' while some applauded vehemently, declaring that if they had but a thousand such soldiers, they would soon crush the Dungan insurrection.

Besides our trusty Faust, we now took a large and very savage Mongol dog, called 'Karza,' to serve as a watch-dog. This animal followed us through the whole of our second expedition, and was of great service. He soon forgot his former Mongol masters, and was a most inveterate enemy of all Chinese, frequently ridding us of intrusive visitors. On first acquaintance, Faust took a dislike to Karza, and the two were bitter enemies to the last. It is remarkable how seldom European dogs fraternise with their Chinese or Mongol brethren, however long they may live in company with them.

Among other articles of outfit, we supplied ourselves with four flat water-barrels,[1] each holding about eight gallons. We had suffered terribly from the want of water during the hot weather in the first summer of our travels, and profiting by our past experiences we took a supply this time. Altogether, our equipment was more complete than last year. But the baggage for our second expedition weighed 27 cwt., making in all nine camel-loads. Every day we helped the Cossacks to pack the loads on the camels, having been unable to find a Mongol to replace the one who had accompanied us from Ala-shan to Kalgan, and who had refused to return to his home with us.

Before starting on our journey I sent a report to the Geographical Society, giving an account of our first year's travels, concluding in these words: 'Thanks to the cordial assistance rendered by our ambassador at Peking, I am now supplied with a passport from the Chinese Government to enable me to enter Koko-nor and Tibet. I have also two new Cossacks who appear to be trustworthy; and if we are all able to do our best, M. Pyltseff and I hope, notwithstanding all the difficulties which must beset the path of the traveller in countries so remote and amidst so unfriendly a people, to succeed in our enterprise.' These expectations were fully realised, and good fortune never deserted us.

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[1] When the Mongols cross the Gobi in summer they always carry some of these flat water-casks, which they call *Khubina*; two of them filled with water make a load for one camel.

On the morning of March 17th we left Kalgan, taking the same route by which we had returned the year before from Ala-shan. The first evening we again felt the severity of the climate of Mongolia; spring had not commenced here, although at the end of February the weather at Kalgan was tolerably warm. Waterfowl had appeared in large numbers, and insects were numerous. On the plateau, however, all this was changed. The snow had certainly all melted, but thick blocks of last winter's ice still encumbered the streams; the thermometer marked several degrees of frost, cold winds prevailed, and birds of passage had not yet appeared; in fact, the steppes of Mongolia bore a wintry aspect.

Like the spring of last year, the frost, wind, and snow, varied by an occasional warm day, continued throughout March and even the whole of April. The atmospheric changes, especially from heat to cold, were very sudden. Thus at 1 P.M. on March 25th, the thermometer marked 22° Cent. of heat (72° Fahr.), and the following day 5° Cent. of frost (23° Fahr.). Again, in the beginning of April, after some warm days, accompanied by thunderstorms, on the night of the 12th two feet of snow fell, and the mercury receded 19° Fahrenheit, after which frost and snow continued till the end of April, when summer weather suddenly set in, in the valley of the Hoang-ho.

The early spring this year differed from the last in the greater frequency of snow-storms and comparatively rare occurrence of NW. winds, although it blew hard for several days in succession. The dryness of the air was as remarkable as ever, a fact we were reminded of not only by the psychrometer, but also by the extraordinary dryness of our lips and hands, the skin of which cracked and had a polished appearance.

The flight of birds even in March was very small; during the whole of that month we only remarked 26 kinds,[1] in small numbers, sometimes only one or two of a species. Geese and cranes appeared in large flocks, but they flew high, hardly ever alighting to rest. Even in the wooded mountains of Munni-ula, where we passed the latter end of April, birds of passage, including small birds, were very scarce. In all probability, these winged wanderers, in their flight to the North, keep as long as they can within the limits of China Proper, sheltering themselves behind the great border ranges of the plateau, only ascending the latter when driven to their last extremity and compelled to turn their backs on the warm plains of China, and face cold and hunger on the barren deserts before they can reach their favourite northern haunts. Yes! even Siberia, awful as the name may sound to many, is a paradise compared to these deserts; its spring is real spring, not the crippled substitute which greets you in Mongolia. Here, even in April, nothing reminds you that Nature has awakened from her winter's sleep—everything is yet dead and inanimate. The yellow grey steppe appears as uninviting as ever; the carol of the lark or the song of the linnet are rare sounds, and no other songsters visit these plains. The streams are still waterless; the salt lakes drier than in summer, when rains supply the evaporation, and the icy cold blasts of winter heighten the dreariness of the landscape.

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[1] They appeared in the following order:—Anser segetum, Anas rutila, Cygnus musicus, Milvus govindus, Larus occidentalis (?), Vanellus cristatus, Saxicola leucomela, Saxicola Isabellina, Motacilla paradoxa, Ruticilla erythrogastra, Upupa Epops, Ardea cinerea, Anthus pratensis, Anser grandis, Larus ridibundus, Anas tadorna, Anas crecca, Anas acuta, Recurvirostra Avocetta, Aegialites cantianus, Grus Virgo, Cygnus olor, Anser cinereus, Lanius major, Grus cinerea, Totanus calidris

For a little more than a month we journeyed from Kalgan to the Munni-ula range, where we determined to make some halt in order to observe the flights of small birds and collect the spring flora of these mountains. We had first intended returning to the Hoang-ho in the beginning of March, crossing that river over the ice into Ordos, and there watching the migration of birds of passage; but we were disappointed in our expectations, only arriving at the Munni-ula mountains on April 22nd, by which time most of the birds were gone. We had therefore to give up our second visit to Ordos, and content ourselves with the Munni-ula.

Here, towards the end of April, vegetation made rapid progress, especially in the lower and middle belts on the southern slopes of the mountains. The wild peach-trees and bushes were in full blossom, relieving the sombre tints of the hill-sides, which were not yet green. The ravines, particularly where the sun's rays found entrance, were covered with young grass and here and there little flowers such as the anemone (*A. Pulsatilla* and *A. barbulata*), milk vetch (*Astragalus* sp.) and *Gagea* sp. peeped forth. The poplar, aspen-tree, and willow were in leaf, and the buds of the white and black birch bursting. On the higher alpine meadows vegetation had not yet felt the warmth of spring, but the snow had thawed even on the highest summits of the mountains.

Judging from the situation of the Munni-ula, in the midst of bare steppes half way between north and south, one would have expected that numbers of small birds would have been attracted hither; but this is not the case. During the eleven days we spent here we found only four more kinds of birds[1] than we had observed in July of the previous year; and even these were solitary specimens which had apparently found their way hither by stealth or by accident.

Disappointed in our anticipated ornithological harvest, we left the Munni-ula on May 4th, and started for Ala-shan, ascending the left bank of the Hoang-ho, i.e. by the same route as we had taken in winter when returning to Kalgan. The only difference we made this time was in not crossing the Kara-narin-ula, but keeping the whole way at the foot of these mountains. After entering the valley of the river, we passed three days at a place called by the Mongols Kolo-sun-nur, where rice-fields are cultivated by Chinese, who irrigate them by means of artificial canals leading from the Yellow River. On this flooded land we counted about 30 kinds of birds, chiefly belonging to the orders *Grallatores* and *Natatores*, of which we had seen none on the dry steppes of Mongolia.[1] Even here these birds were not numerous; the best time for their migration had passed by, and only a few lingered behind the rest. Our ornithological studies this spring were so far unsuccessful, and the only observation, and that of a negative kind, which we were enabled to make was that birds of passage shun the waterless deserts of Mongolia.

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[1] Turdus ruficollis, Emberiza pithyornus, E. pusilla, Scolopax rusticola.

Our occupations were now varied with a little fishing. The carp (*Cyprinus carpio*) spawn early in May, and every morning and evening large numbers might be seen disporting themselves in the shallowest parts of the flooded fields. Here was an opportunity not to be lost for satisfying our craving for a fish diet. We first pulled off our boots, and, taking our guns, waded towards the spot where we could see the carp jumping. So intent were they with their games as not to notice us, and we generally approached to within a few paces of them; then, watching our opportunity, we shot them as they rose to the surface, and in this way secured some fine fish every day.

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[1] Anser cygnoides, Anas pœcilorhyncha, Anas falcata, Anas querquedula, Fuligula cristata, Fuligula ferina, Phalacrocorax Carbo, Pelicanus crispus, (?) Podiceps sp., Sterna leucoptera, Totanus ochropus, Tringa subminuta, Scolopax gallinago, Actitis hypoleucus, Aegialites minor, Platalea leucorodia, Ardea alba, Limosa melanuroides, Hybsibates himantopus, Botaurus stellaris, Glareola pratincola, Haliaëtos Macei, Pandion sp., Motacilla citreola, Motacilla flava, Anthus Richardii, Hirundo rufa.

In the beginning of May the heat in the valley was intense; the mercury rose to 31° Cent. (88° Fahr.) in the shade, whilst the water was heated only to 21° Cent. (70° Fahr.), rendering bathing a pleasant relief. Hardly any rain fell, and vegetation was checked by the excessive heat as much as it had been by the preceding cold season. The yellowish grey tint of the valley at this time was particularly unattractive; only a few tufts of green grass had sprung up, in the midst of which solitary flowers (*Thermopsis lanceolata*, *Astragalus* sp., *Hyperoum* sp., *Potentilla* sp., *Iris* sp.) raised their heads timidly in the midst of surrounding desolation. Wherever a white layer of salt covered the soil, it had the appearance of driven snow, even when you were close to it; in such spots not a blade of green could be seen—nothing but withered clumps of *dirisun*. The whirlwinds frequently raised columns of saline dust, which blinded us and aggravated our sufferings. Only those parts of the valley were a little more cheerful where last year's vegetation had been completely burnt up by the early spring heats, and where towards the middle of May some green grass had appeared.

In the border range vegetation was equally scanty. The high rocks and *débris* on the hill-sides appeared the same as in winter; even the ravines in the mountains were very little better. Naked sand, boulders and crumbling rock, a few crooked dwarf elms, wild peach, or clumps of acacia, were the ever-recurring objects which met the travellers' eyes. Even on the banks of some tiny rivulet, which, after flowing a very short distance above ground would quickly hide itself beneath the soil as though it feared to encounter the terrors of the wilderness, the narrow fringe of verdure was mostly devoured by the Mongol goats.

The boundary of Ala-shan is marked by a line of drift sands, which, as we know, cover the whole of Trans-Ordos. The scantiness of the vegetation, notwithstanding the advanced season (end of May), was even more remarkable here than in the country through which we had passed. Indeed, the aspect of nature hardly differed from that which we had observed late in the previous autumn: here were the same cheerless yellow sands, the same patches of *zak*, the same clayey hillocks with clumps of stunted *karmyk*. If perchance some stray flowering grass (*Sophora flavescens*, *Turnefortia Arguzia*, *Convolvulus Ammani*, *Peganum* sp., *Carduus* sp.) appeared, it was only as a stranger or foster-child of so unprolific a parent. Two or three kinds of bushes (*Convolvulus tragacanthoides*, *Nitraria Schoberi*, *Calligonum Mongolicum* ?) were in flower, but they only grew in clayey spots so far apart as not to brighten the prevailing gloom of the landscape.

Still less can be said of animal life in these regions. The flooded fields in the valley of the river were the resort of water-fowl, and in the tall tufts of *dirisun* could be heard the call of many a pheasant; small birds were also now and then seen, but on entering Ala-shan all was changed, and scarcely a note broke the stillness of the desert.

The same death-like silence reigned in the mountains bordering the left valley of the Hoang-ho. When I passed the night near the summit of Mount Koir-Bogdo, while on a hunting excursion, the evening and early morning were as still and voiceless as in winter; the only sounds were the noise of the buzzard, and the hideous cry of a kite or vulture.

The climate of these regions harmonizes with their whole nature. After sultry heat in the beginning of May, it suddenly froze on the 17th of that month, the thermometer marking 2° Cent. (29° Fahr.) at sunrise; to this succeeded hot weather, followed by a short interval of moderate temperature, after which the heat again became intense, the thermometer in the middle of June registering 40° Cent. (104° Fahr.) in the shade.

In April and May violent winds sometimes occurred, but less frequently than at the same season in the previous year. While these lasted, the air was so thick with dust as almost to prevent respiration; the sun was darkened and everything covered with a thick layer of dust, which entered eyes, nose, and mouth. The direction of the wind was variable: during April it generally blew from the NW.

and SW., or cold quarters; in May from the SE., or warm quarter.

Rain fell more frequently in the latter month than in the former, and was sometimes accompanied by thunderstorms; but it only lasted a short time, and the atmosphere became terribly dry. All our things suffered; we were obliged to moisten our collection of plants, otherwise they became so brittle as to break into little bits. I could hardly write my journal, for the ink dried in the pen as rapidly as it froze in winter, thus affording a curious instance of similar effects being produced by two opposite causes—heat and cold.[1]

Towards the end of May we entered Ala-shan, and soon afterwards met two officials sent from Din-yuan-ing by the prince to welcome us and conduct us through the desert. The real motive of their politeness was impatience on the part of the prince and his sons to receive our presents, of which they had heard through Baldin Sordji. We met this lama in April, near the Munni-ula, on his way home from Peking, whither he had been sent by his master on business. We presented him with a token of our gratitude for his past services, and showed him the handsome presents which we were bearing to the princes. With these gifts we hoped to win over to our interests the lords of Ala-shan, upon whose good-will our future journey to Lake Koko-nor entirely depended.

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[1] 'The parching air
Burns frore and cold performs the effect of fire.'
PARADISE LOST.—Y.

The officials who met us at once began asking about the presents; they told us how desirous the princes were to receive them, and entreated me to send them in advance; to this I consented, and forwarded to their sovereign a large two-coloured plaid and a revolver, to his eldest son a plaid and a microscope, and to each of the younger a Remington pistol, with 1,000 prepared cartridges. On receiving the presents, although the hour was late, one of the officials immediately took his departure, the other remaining with us.

On June 7 we arrived at Din-yuan-ing, and established ourselves in a house prepared for our reception. The inquisitiveness of the people as usual gave us no peace, until we tied our fierce Karza to the gate of our house, where he kept the rascals at a respectable distance.

The evening of our arrival we were visited by our friends, the Gigen and Siya. My uniform as an officer of the staff, which I had purposely brought with me from Peking, produced a great impression upon the young princes, who examined it attentively. They were now more than ever convinced that I was a high functionary, perhaps the trusted agent of the Emperor himself. They had often questioned me last year about this; but when they saw me appear in a brilliant uniform, their suppositions were entirely confirmed. Henceforward I received the title of *the Czar's officer*, by which I was called during the remainder of our journey. I did not attempt to remove this opinion of my importance, which suited me, inasmuch as it explained the object of our journey. In future the people always said of me that the Tsagan-khan (i.e. White Khan) had sent his officer into their country to see them and their land with his own eyes, that he might return home and tell him everything.

Early the next morning Sordji and others called on us on behalf of the prince and his sons to examine and buy our merchandise, requesting us in their names to sell to none but themselves. Now began our troubles. One lama took a microscope, another a stereoscope, a third soap and needles, a fourth cloth, &c.; all these articles kept continually changing hands as first one, then another examined them. The princes were not nearly so eager to buy this year as they were last, although we fixed much lower prices. The old prince, however, was delighted with the stereoscopes and slides, and at once bought our whole stock.

In the meanwhile an excellent opportunity presented itself of getting to Lake Koko-nor. At Din-yuan-ing we overtook a caravan of twenty-seven Tangutans[1] and Mongols, who had lately arrived from Peking, and were about to pursue their journey to the temple of Chobsen, in the province of Kan-su, forty miles to the NNE. of Si-ning, and five days' journey from Lake Koko-nor. The Tangutans were overjoyed at our proposal to join their party, counting on our protection in case of an attack by Dungans. The further to impress them with the efficiency of our arms, we went through some firing exercise with rifles and revolvers. Numbers of spectators were present, and great was their astonishment at the rapidity and accuracy of our fire. The Tangutans almost danced with delight at their good luck in having secured such travelling companions.

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[1] The Tangutans are allied with the Tibetans. A description of them will be found in Chapter IV. of this volume.

The opportunity which thus presented itself of reaching Chobsen was a real piece of good fortune. Without it we could not have expected to procure a guide even across Southern Ala-shan. We were still more pleased when we heard from the Tangutans that their temple was situated in the midst of lofty mountains covered with forests, abounding in birds and wild animals. In fact, nothing could have been more opportune. We had only to obtain the consent of the Prince of Ala-shan to our departure with the Tangutans, who could not otherwise take us with them.

He, however, tried by every means in his power to deter us from proceeding to Koko-nor. What his motives may have been I cannot say; most probably he obeyed instructions from Peking, and had perhaps received a rebuke from head-quarters for his civility to the Russians last year.

However that may have been, Baldin Sordji now took an active part in forwarding his master's intrigues; at first he suggested our consulting the lamas as to whether the auguries were in favour of our journey. Of course they would have opposed our departure, and prophesied all sorts of misfortunes if we went. The same ruse was tried last year with the view of discovering who we really were, and they threatened, if we persisted in our refusal to enlighten them, to find out through the Gigens; but all these artifices signally failed, owing to our determination not to submit to anything of the sort. We were then told that the Tangutans would travel very rapidly—thirty miles a day, or even more, and that we could not endure the fatigue of such long marches, especially as we should have to travel a good deal by night. To this we begged Sordji to mind his own business, and not trouble himself about our comforts on the road, of which we were the best judges. Finding that our resolution was still unshaken, he drew an alarming picture of the difficulties of the road, of the lofty mountains which we must cross on the way to Chobsen, and which were almost if not quite impassable for camels. 'We had better wait a month,' he added, 'and then the Amban (governor) would give us guides to Koko-nor.' But having been assured a few days before by the same individual that no guides for Koko-nor could be procured at any price in the whole of Ala-shan, and that not even the threat of capital punishment in case of refusal would induce them to go, so afraid were they of the Dungans, we put no faith in his promises. To make this bait more tempting, a Mongol officer called on us, of course at the bidding of Sordji, and related as a profound secret how the prince had that two guides to be in readiness to escort us to Koko-nor, or even to Tibet if we wished to visit that country.

In the meanwhile our interview with the prince was put off from day to day under the pretext of his indisposition; the real cause of the delay being his fear lest I should insist on being allowed to depart with the caravan of Tangutans. Nor did we see the eldest son; the Gigen and Siya came frequently to visit us, without, however, inviting us to their house as formerly. In fact, our reception was far less cordial than last year.

On the other hand, our finances were in a worse plight than before. Of 87 lans (22*l.*) which we had when we started, only 50 (12*l.* 10*s.*) remained, and we had to buy six new camels and two horses to continue our journey. Three of the eleven camels with which we had left Kalgan, and both our horses, had died on the road. The only way of raising money was by the sale of our merchandise. Had the prince only known of our circumstances, he could have detained us without the slightest difficulty by refusing to buy our goods and forbidding any of his subjects from purchasing of us. If we let slip this opportunity, and the caravan were to leave Din-yuan-ing without us, we must for ever despair of reaching Koko-nor even with money. Here was a nice state of affairs caused by a beggarly want of funds.

Good luck again came to our rescue in the most extraordinary way. The Gigen agreed to give us six camels and 100 lans (25*l.*) in money for a Spencer breech-loading rifle. He certainly valued the camels at 50 lans (12*l.* 10*s.*) a piece; on the other hand, the price I had asked for the gun was eleven times more than I gave for it, so that the thing was as broad as it was long. After receiving about 120 lans (30*l.*) more for some of our other merchandise, we were sufficiently independent to act with decision. I told Sordji that I would certainly accompany the Tangutans, and demanded a return of the things taken, or payment for them in money.

On the evening of June 13, the day before that fixed for the departure of the caravan, Sordji came to inform me that the prince had ordered the Tangutans to remain two days longer in town. All this time the lama never ceased urging us to remain, assuring us of the prince's grief at our speedy departure, of his fondness for Russians, and of his liking for their goods, especially stereoscopes, guns, cloth, soap, candles, &c. counting them off on his fingers as he repeated the words. He entreated us to give a gun to the prince, and another to his eldest son, or some other good article, even if it were Russian clothes. In fact, nothing could exceed the shameless behaviour of the prince and his sons in asking us to make them presents. They were so importunate at last that we were obliged to conceal some of our things whenever we expected visitors.

After persisting in my demands, I received 258 lans (62*l.* 10*s.*) from the prince for the articles he had taken, which, added to the sum we already possessed, amounted to 500 lans (125*l.*) and fourteen camels.

We were certainly very fortunate. The departure of the Tangutan caravan was positively fixed for the morrow; and although we had received no intimation from the prince of his consent to our journey, we were no longer told that we must stay, and his family seemed to be aware of our plans, the Gigen having sent us a pair of horses as a present.

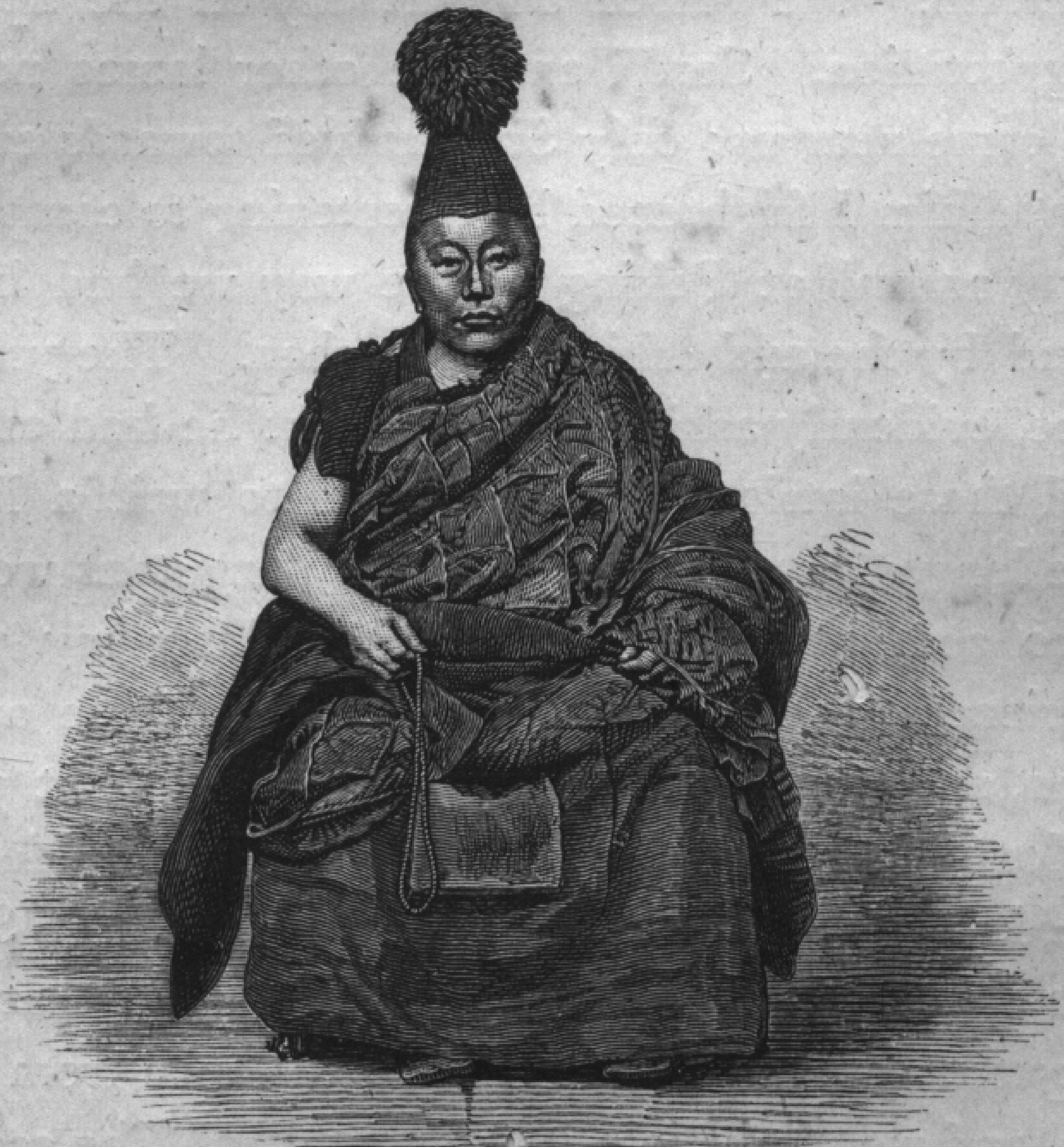
It would be difficult to express our satisfaction as we worked till late at night making preparations for a start the next day. Before sunrise the following morning all our party were astir loading the camels. Half of them were ready when a Tangutan suddenly appeared with the news that the caravan would not leave that day, a band of Dungans having been reported to have been seen in the vicinity of Din-yuan-ing. Unwilling to believe the Tangutans, I sent M. Pyltseff and a Cossack to enquire if the report were true; they soon returned and told us that the caravan was quite ready to march.

Sordji now appeared with his version of the story, which he reiterated at length: my patience was completely exhausted, and I abused him in round language. He then explained that the Tangutans did not wish us to accompany their caravan, and that they were bad people, although hitherto he had always praised them.

At this moment I heard that the caravan was leaving the town. Accordingly, we finished loading the camels, and, escorted by the mob, marched out of the courtyard of the house with the intention of following. Before we had proceeded a hundred paces, Siya rode up and assured me that the Dungans had been again heard of, and that, although it had started, the caravan would be turned back; the young prince ended by entreating us to remain till the whole affair was satisfactorily explained. Siya's companion, the lama chief of the Tangutans, who had been so anxious hitherto that we should travel together, now repeated the words of the prince, and urged us to defer our departure.

His appearance and his sudden change of manner had more weight with us than all the warnings of the prince. We could no longer count on him as a friend, but must regard our future travelling companion as an enemy; how, then, could we place confidence in him? As a last resource, but one which I knew could not lead to much, I asked Siya if he would give me his word of honour that we should not be cheated, and that the caravan would not leave without us? 'I give it willingly! I answer for it,' he joyfully exclaimed, caring very little how he attained his object of detaining us. The lama chief also assured me that they would not start without us. Accordingly, we turned into the prince's suburban garden and pitched our tent, awaiting further events.

How can I describe our disappointment, particularly at first? It was certainly too bad. The long-cherished object of our desires, to gain which we had suffered so much, the prize which we had seemed on the point of winning, was suddenly snatched from our grasp. We knew not for how long. Had we been told on our first arrival at Din-yuan-ing that we must not proceed with the Tangutans, the disappointment, although great, would not have been half what we now experienced. We had never ventured to hope for such a favourable opportunity, and now it was doubly hard to bear when success appeared so certain. We passed all that day on the tip-toe of expectation. Sordji and the other lamas never once came near us; only Siya arrived towards evening, and him I frightened by threatening to complain on my arrival at Peking of the way we had been treated by the authorities of Ala-shan. The young prince, evidently ashamed at the part he had taken in all these intrigues, entreated us to wait a little while longer, assuring me that the Tangutans would on no account leave without us. After my past experiences I could put little faith in these assurances, and was turning over in my mind what part of Mongolia I should next explore, when suddenly, towards evening the following day (June 17), Siya again appeared, bearing the welcome tidings that the Tangutan caravan was at a short distance from the town, and we might join it the next day. The scouts who had been sent to reconnoitre reported that nothing could be seen of the Dungans, and that the alarm was a false one. Of course this was merely to blind us; no Dungans had passed anywhere near, but most probably the Prince of Ala-shan wished to gain time to send to Ning-hia-fu, and ask for instructions from the governor of that town how to act under the circumstances. The secrecy observed with regard to all travellers in China is so great that I could not discover, either then or afterwards, why we were detained at the moment of departure, and prevented for two days from proceeding on our journey. However, we had no more time to think of it, and we were overjoyed at the favourable turn of events.



KUTUKHTU-LAMA OF HIGH RANK.
(From a Photograph lent by Baron Osten Sacken.)

The prospect of fulfilling our great enterprise gave us no rest the remainder of that day and night. The caravan with which we were now associated was equipped at Peking by one of the most important of the Kutukhtus of Mongolia—the Gigen Djandji, owner of a great many churches at Peking and in Mongolia, including the renowned monastery of *Utai*, not far from Kuku-khoto. The saint himself was born at the temple of Chobsen, in the province of Kan-su, whither our future companions were now travelling. They were a motley assemblage. Exclusive of our four selves, the caravan numbered 37 men, ten of whom were lama-warriors, sent as an escort by the Gigen of Ala-shan; the others were mostly Tangutans, natives of Chobsen; there were also a few Mongol pilgrims on their way to pray at Lhassa. For the conveyance of all their luggage, 72 camels and 40 horses, including our own, were required. The chiefs of the caravan were Donir-Lamas (treasurers of Lamasiries), Tangutans by birth, and excellent obliging men. To cement our friendship with them, I gave to each one a small plaid.

All the members of the caravan were armed with matchlocks, lances, or swords. They had the reputation of being brave, almost foolhardy men, to venture at such a time into a country infested with bands of marauding Dungans. The courage of our companions, however, as we shall presently see, was not great even when the danger was only of an imaginary kind.

The lama-warriors carried English smooth-bores, bought by the Chinese Government, and sent from Peking to Ala-shan. Their guns, however, were of an inferior kind, and were rendered still more unserviceable by careless treatment. But the appearance of the escort in their red blouses and forage caps, mounted on camels, was very striking and picturesque; as for their fighting capacities, they were no better than their fellows. But the most remarkable personage of the party was a Tangutan named Randzemba, on his way from Peking to Tibet. He was a man of about forty, frank in manner and good-natured, very talkative, willing to assist everyone, and have a finger in everybody's pie. The loquacity of our new friend, accompanied with his emphatic gestures, suggested our bestowing upon him the sobriquet of the 'many-worded, *Avvakum*,' which very soon passed through the caravan, and became thenceforward the usual appellation of Randzemba. His ruling passions were the chase and target firing; the latter amusement was indeed frequently indulged in by the whole party. Almost every day, as soon as we had arrived in camp, some would begin shooting at a mark; others would soon gather round, first as mere spectators, then, desirous of trying their skill, they would bring their guns, and in this way the firing became general. Randzemba was the leading spirit of all these parties. It was enough for him if he heard the report of fire-arms; no matter what he might be doing at the time, even though asleep or resting after a long march, the indefatigable Avvakum would rouse himself at once and proceed barefooted to the scene of action. Here he would frequently advise how the target should be placed, upon the size of the charge, how a broken gun might be repaired, &c. Although he had the reputation of being a good sportsman, he certainly did not distinguish himself as a marksman, and invariably used such heavy charges that his shoulder was constantly swelled from the recoil.

Our friend always rode on horseback, leaving the laden camels to two of his companions. He was ever on the alert for game; no sooner had his quick eye detected antelope than he galloped up to offer us the option of shooting it, or sometimes stalked them himself, having first lighted the slow match of his gun. His companions, upon whom devolved the whole care of the pack animals, were evidently not very well pleased with their friend's turn for sporting. On one occasion they punished him by obliging him to lead the pack animals, when, to our surprise we saw Randzemba no longer mounted on his horse, but leading his camels by the halter. He did not, however, endure this restraint on his liberty for long. As ill-luck would have it, antelope were plentiful that day, and Randzemba, perched upon the back of a camel, could see a long way. In whatever direction he chanced to look, his eyes were sure to rest upon some of these animals; this was too much for his forbearance, and after watching us start off in pursuit of one of the kara-sultas (black-tailed antelope), his excitement knew no bounds, and, oblivious of all else save the one absorbing passion of the chase, he led his pack animals into a ravine, where they were found by his countrymen, who, seeing how impossible it was to put any trust in so restless a mortal, relieved him from his duties, and allowed him once more to mount his steed and enjoy his favourite pursuit.

The day after we joined the Tangutans the caravan started. We brought up the rear with our camels, in order not to detain the others by any stoppage arising from the refastening of a pack or any accident of that kind. Although the sale of our merchandise at Din-yuan-ing had considerably diminished the bulk of our baggage, the necessity for laying in a stock of provisions (rice and millet), which we had heard were unobtainable in Kan-su, besides other minor purchases, such as spare ropes, felting, &c., increased our effects so materially that we had still nine good camel-loads. It was now more difficult for our party of four to manage this train, being no longer independent as to our movements, but obliged to keep pace with the caravan. I tried in vain to hire a Mongol assistant, but no one would come even for a good sum of money. It was with the greatest difficulty that I succeeded in persuading some of the Tangutans to allow our camels to pasture with their own at night on payment of a rouble (2*s.* 6*d.*) a day to the watcher. As for the other work, we had to do it all ourselves, and could find no spare time even to think of science on the road.

We generally rose about midnight, in order to avoid the heat of the day, and marched from twenty to twenty-five miles, or even more sometimes, to the halting-place, which was usually near a well; but, if there were none near, we would dig a hole in the ground, in which the salt water would collect. Some of our companions had often made the journey before, and knew the way perfectly across these deserts. They could tell directly which were the most likely places for water: in some places the precious fluid was not more than three feet below the surface; in most of the road-side wells it was generally very bad, and, to make it worse, the Dungans often threw into them the bodies of dead Mongols. I cannot help shuddering now when I remember how one day, after having drunk tea, we proceeded to give some drink to the camels, and discovered the putrid carcass of a man lying at the bottom of the well from which we had drawn water for our own use!

We could not sleep at the halting-places because of the great heat of the soil and the stifling atmosphere. Notwithstanding which, we had to remove the pack-saddles of the camels to prevent their backs from becoming sore, as they infallibly would in the hot weather if we neglected this precaution. It took us an hour to water our animals—a tedious process which had to be performed every day in hot weather, each camel consuming on an average six gallons at a time. Even at night our rest was disturbed owing to excessive exhaustion.

For the first few days our tent was beset by inquisitive visitors. They would know everything. Our guns—every article we possessed, no matter how insignificant, was an object of interest to them. They would take it up, examine it closely, smell it, and ask answer again and again, as the curiosity of every new-comer had to be satisfied. This was very tiresome, but could not be avoided if we wished to keep on good terms with our fellow-travellers, upon whom the success of our journey so greatly depended.

A good deal of curiosity, almost amounting to suspicion, was excited by our habit of collecting plants, recording meteorological observations, and writing a journal. I tried to avoid suspicion by explaining that I made notes of all I saw to refresh my memory when I returned home, and had to give in my report; as to my plants, they were for medicinal purposes, and the stuffed birds and animals for exhibition; the object of my meteorological observations was to know beforehand what the weather would be. Of the truth of the last statement they were quite satisfied, after a fall of rain which I had foretold by means of the aneroid. The title of '*the Czar's officer*,' which had followed me from Din-yuan-ing, served to dispel the doubts and distrust of our companions. However, I could not make many observations which I should otherwise have done for fear of causing great suspicion, and deferred doing this till my return journey, contenting myself for the present with a route survey, which was very imperfect, owing to the want of a pocket compass,[1] and the intrusiveness of our companions. Sometimes it was absolutely necessary to make an entry in my pocket-book; for this purpose I intentionally loitered behind the caravan, and, sitting down on my heels, made notes of the surrounding objects. Even then I had to exercise the greatest caution, because, if once found out, I could never have removed the suspicions which would have arisen as to the objects of our journey.

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[1] I was obliged to give both my small compasses to the princes of Ala-shan.

The difficulties of collecting plants were also very great. No sooner did we gather some herb than a number of the Tangutans would surround us, exclaiming, '*Yamur yem* ?' (What medicine is it ?) or, '*Tsisik sehken fuh na* ?' (Is it a good flower ?) When any of our party shot a bird, they would ride up and enquire what bird we had killed? was it good to eat? how had we shot it? &c. These annoyances, however disagreeable, had to be endured with the best possible grace.

The road from Din-yuan-ing led at first south, and afterwards almost due west, to the town of Ta-jing, which is situated within the limits of the province of Kan-su.

The south of Ala-shan differs but little from the northern and central parts of that country: like them, it is a wilderness in the full meaning of the word; its sands are even more extensive, and have well earned their Mongol appellation of *Tingeri*, i.e. sky. These drift-sands form the southern border of Ala-shan, from the Hoang-ho on the east to the river Etsina on the west, as we were told by the Mongols. Having crossed the Tingeri for ten miles in their narrowest eastern part, we became well acquainted with them.

The Tingeri have the appearance of innumerable hillocks, lying close together, without any regularity. They are from fifty to sixty feet, rarely one hundred feet high, composed of fine yellow sand on a hard clay subsoil, with occasional bare patches of clay. A few rare tufts of mat grass (*Psamma villosa*) and field mugwort are here and there scattered over these clayey areas, now and then protruding through the sand; or more rarely some shrub of the leguminous order makes its appearance. But such scanty vegetation makes no impression on the death-like character of these deserts, the only living creatures in which are the kites and small black *marmot.* The loose sand, heated by a burning sun, is constantly carried by the wind from one hillock to another, lying in ridges or furrows between the mounds. These greatly impede the progress of the caravan, especially of the pack-animals, which have to climb from one hillock to another, sinking deep at every step in the loose soil. There is no track here of any kind; nothing but dried camels' dung, and an occasional skeleton of one of these beasts serve to show you the direction you must take. You generally steer by the sun. It is terrible to be caught in such places in a whirlwind. The summits of the sandy hillocks at first appear as though enveloped in smoke; the air becomes darkened with clouds of sand, which obscure the sun. The best time for crossing these hillocks is after a rain-fall, when the hardened soil supports the weight of the camels and the air remains clear.

On the clay flats, which alternate with the bare sand, the most common plants in Southern as in Northern Ala-shan, are the budarhana and karmyk, occasionally the field mugwort, and a low stunted shrub, the *Sarcosygium xanthoxylon*; the zak, or *saxaul*, is never found here. The country is undulating, and a few small hills now and then vary the monotony, sometimes prolonged into chains. These hills, never rising more than a few hundred feet above the surrounding plain, are generally entirely devoid of vegetation; such as there is, it does not differ from that of the adjacent desert. During our march with the Tangutan caravan we saw no inhabitants. Everything was destroyed and pillaged by the Dungans, who sometimes made their appearance in bands in Southern Ala-shan in quest of more plunder. We saw by the roadside several human skeletons, two ruined temples, and whole heaps of putrefying corpses, half devoured by wolves.

After crossing the Tingeri, we directed our march along their southern border, over barren clay with only two kinds of saline plants, and soon the magnificent mountains of Kan-su rose in front of us, towering above the adjacent plains like a huge rampart; while in the far distance the snowy peaks of Kuliang and Liang-chu might be discerned. One more march, and this grand range stood before us in all the majesty of its matchless beauty. The desert as suddenly terminated. Hardly more than a mile from the sands, which extend far to the westward, cultivated fields, flowery meadows, and Chinese farmhouses gladden the sight. Culture and desert, life and death, are placed in such close juxtaposition that the astonished traveller may well doubt his own eyes.

This contrast in the nature of the country which still forms the boundary between that of roving nomads and that of settled cultivators is defined by the same Great Wall which we had seen at Kalgan and Ku-peh-kau. Hence it continues westwards over the mountains bordering the plateau, passing round the south of Ordos, and abutting on the Alashan mountains, which form a natural barrier to the desert. From the southern end of the last-named range, the Great Wall continues along the northern border of the province of Kan-su, past the towns of Lang-chau, Kan-chau, and Suh-chau to the fortress of Kia-yui-kwan. The Great Wall (if we can call it by such a name here) bears no resemblance to the gigantic edifice near Peking. Instead of an immense stone building, all we saw on the border of Kan-su was a mud wall, greatly dilapidated by time. A short distance to the north of it, about three miles and a half apart, stand clay-built watch-towers twenty-one feet high, by about as much square at the base, now entirely deserted, but formerly garrisoned by ten men, whose duty was to signal the approach of the invader. The line of watch-towers is said to have extended from the province of Ili to Peking itself, and news was conveyed by it with marvellous rapidity. The signal was smoke which rose from the summit of the tower, a fire having been lighted inside. The Mongols gravely assured me that the fuel used on these occasions was a mixture of wolves' and sheep's dung, and that the smoke rose perpendicularly in the air, no matter how strong a wind blew.

Rather over a mile beyond the Great Wall lies the small town of Ta-jing, which escaped the Dungans. At the time of our march it was garrisoned by 1,000 Chinese troops, Solones[1] from Manchuria, near the banks of the Amur. They all understood Russian, and some could even speak it, saluting us with a 'How-do you do? I hope you are well.'

Our caravan did not enter the town, but halted immediately outside its mud wall, where we hoped to obtain some respite from unwelcome visitors. But vain were such hopes. In a moment the news of our arrival had passed through the town, and we were invaded by crowds of sightseers. Not content with looking from a distance, the Chinese actually forced their way into our tent, and gave us not a moment's peace. It was no use driving them out, or setting the dog at them, because no sooner had one lot disappeared than another made its appearance. Officers rode up to our tent, and asked us to show them our guns and make them some present. On our refusal, they demanded to see our passports, and threatened to prevent us from proceeding on our journey. This continued for two days, i.e. as long as we were at Ta-jing. Here we found a very rare thing—some excellent leavened bread, baked with yeast.[1] This was the first of the kind we had seen, and we never afterwards saw any more of it. Of course we took a good supply for the road. Whence this mode of baking bread was introduced I cannot say, although the Solones told us that some years ago they taught the art to the local bakers, having learnt it from the Russians on the Amur.

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[1] See Supplementary Note.

The best road from Ala-shan to the temple of Chobsen, and also to Si-ning and Lake Koko-nor, passes through the towns of Sa-yang-chen and Djung-ling; but we took a more westerly course through Ta-jing, in order to avoid the Chinese towns and population, which is thickly scattered along the more easterly and better road. Our fellow-travellers were so well aware of the difficulties to which they would have to submit at the hands of the Chinese authorities and soldiers, if they marched through the populous region, that they preferred following the mountain paths leading from Ta-jing to Chobsen through districts thinly inhabited and depopulated by the Dungans.

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[1] In China only unleavened bread is used, and that always newly baked. The Abbé Huc, however, in the description of his journey through Tartary, mentions some excellent leavened loaves which he found in Kan-su, near the town of Sa-yang-chen, therefore not far from Ta-jing.—Huc, 'Souvenirs d'un Voyage en Tartarie,' &c., t. ii. p. 33.

CHAPTER III.

THE PROVINCE OF KAN-SU.[1]

First sight of Kan-su—Marginal range—Ta-yi-gu—Sung-shan—Abundance of water—Ruined villages—A false alarm—Harsh treatment of prisoner—Gold washings—Profusion of vegetation—Another adventure—Randzemba and the breech-loaders—Mystery explained—Temple of Chertinton; its superior or abbot—We leave our camels and horses—The Rangtu-gol—Cultivated and thickly-populated plain—The Taldi—The temple of Chobsen; its images and idols; its militia garrison—Arrival at Chobsen—Drying the collections—Stagnation of trade—Start for the mountains—Description of the mountains of Kan-su—Northern and Southern chains—Snowy peaks—'*Amneh*' the sacred mountains—Geology—Minerals—Climate—Flora: trees, bushes, &c.—The Rhubarb plant (*Rheum palmatum*)—Method of obtaining and preserving it—Artificial cultivation—Rhododendrons—Characteristic plants of Kan-su—Luxuriant meadow-land—Fauna of Kan-su—Mammals—Birds; their classification—Birds of alpine zone—Absence of water-fowl—Excessive humidity—Thunderstorms—Sodi-Soruksum; splendid view—Mount Gadjur; its sacred lake—Terror of natives—Guides refuse to proceed—Autumn—Camels suffer—Chobsen besieged—Perilous situation—Prepare for defence—Night-watch—Hire guides to Koko-nor—Consult auguries—Halt—Supplies—Departure—A critical moment—Appearance of Dungans—Mur-zasak—Tatung-gol—Koko-nor at last.

WE left Ta-jing on the morning of June 20, and the same day ascended the mountains of Kan-su, where we suddenly found ourselves in a new climate surrounded by a new nature. On first entering this region we were impressed with its lofty elevation and the grand mountains rising to the limits of perpetual snow. Although only twenty-seven miles distant from the desert of Ala-shan, the soil was remarkably fertile, and the humidity of the climate ensured abundance of water. The flora and fauna also marvellously changed; a profusion of rich grass clothed the plains and valleys; dense forests darkened the steep slopes, and animal life appeared in great variety. But to return to our narrative.

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[1] The name of Kan-su is derived from two of its towns—Kan-chau and Suh-chau. Yule's 'Marco Polo,' new ed. vol. i. p. 222.—M.

As is the case with other mountain-chains of the Mongolian plateau, this marginal range in Kan-su shows its full development only on the side of the Ala-shan plain; whilst on the other face the declivity is short and easy. Even the snow-capped peaks of Ku-liang and Liang-chu, about thirty miles to the right of our road, apparently do not rise much above the plateau, and their southern slopes are only marked with occasional patches of snow. The ascent is by a ravine hemmed in by precipitous rocks of schistous clay; the road is tolerably good, and even practicable for wheeled conveyances. On either side are lofty rugged mountains, abounding in excellent pasturage for cattle; forests grow near the axis of the range, but at some distance from the road.

After crossing the pass (nineteen miles from the entrance to the mountains), we came to the small Chinese town of Ta-yi-gu, destroyed by the Dungans, but at this time garrisoned by 1,000 Chinese soldiers. Its height is 8,600 feet, while Ta-jing is only 5,900 feet above sea-level.[1]

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[1] On entering Kan-su, our aneroid got out of order; all further hypsometrical observations were, therefore, made with boiling-water.

Leaving the little town of Sung-shan (also destroyed by Dungans) on our left, we directed our march across an uneven steppe which lay immediately beyond the border range, between it and other mountains that rose in front of us.

We had no further cause for trouble about pasturage or water. Water poured from every cleft in the rocks, and the profusion of rich grass reminded us of our meadows at home. Here we saw dzerens (steppe antelopes), and a small herd of horses run wild, which had been let loose at the time of the insurrection. They were so shy that we tried in vain to capture one.

Traces of the ravages committed by the insurgents now met us at every step. The numerous villages were all in ruins, human skulls littered the ground, and not a soul was to be seen. Our companions showed symptoms of the greatest cowardice; they refused to make a fire at night, lighted their matchlocks, and begged us to go in front: all their fears, however, were dissipated in the most ludicrous way.

In the valley of the Chagrin-gol, the lamas espied some men running away; taking them for Dungans, and overjoyed at the small number of the enemy, they opened fire, although the fugitives were a long way off. My companion and I hastened to the scene of action, imagining that an attack had actually been made, but when we saw how matters stood we remained as spectators. The lamas continued firing although the enemy were by this time out of sight.

After discharging his piece every man shouted at the top of his voice before reloading. This is the usual style of warfare, alternately firing and uttering terrible cries to frighten the enemy.

At length our brave warriors started in pursuit and caught one man who turned out to be a Chinese. He may possibly have been a Dungan for the Mahommedan Chinese do not differ in appearance from their Confucian brethren. It was resolved to put the prisoner to death as soon as the caravan arrived at the next halting-place; in the meantime he was compelled to walk beside his captors. He was caught trying to get off by hiding in the long grass at the road side, so he was tied by his queue to the tail of one of the mounted camels.

On arrival at camp the prisoner was fastened to one of the packs, while the lamas sharpened a sword intended to cut off his head. But now a dispute arose as to whether he should be put to death, some of them wishing to spare his life. Understanding perfectly their conversation, which was in Mongol, the Chinaman never lost his composure. When tea was ready he was invited to join in the meal, receiving as much attention as an invited guest. Greatly to our astonishment he drank it as though nothing out of the common way had happened, the lamas filling his cup while they discussed his execution. Finding this extremely disgusting, we started off on an excursion into the mountains. On our return towards evening we learned that, thanks to the mediation of the leaders of the caravan, the man's life had been spared, and that he would be set at liberty in the morning.

After crossing the Chagrin-gol, a good-sized stream flowing in a south-westerly direction to the town of Djung-ling,[1] we again entered mountains, which now form no part of the border range, but are piled up on the lofty plateau of Kan-su. This chain runs parallel with the largest of the tributaries of the upper Hoang-ho, viz. the Tetung-gol or Tatung-ho, flowing from the north; another equally gigantic range rises on its southern bank. I will presently describe the orography of this region, but now continue the narrative of our journey to the temple of Chobsen.

From the Chagrin-gol we ascended the valley of the Yarlin-gol[2] by a road practicable for wheeled carriages, although it has been much neglected since the Dungan insurrection. No inhabitants were to be seen. We passed several abandoned gold-washings; all the streams in these mountains are said to abound in the precious ore. Water is everywhere plentiful, and the character of the scenery thoroughly alpine. Like the Munni-ula, the Ala-shan range, and most of the mountains of Mongolia, the outer slopes are the wildest; towards the passes the scenery becomes tamer. Some towering peaks, however, are visible even here, as for instance, Mount Gadjur, which we could see on our right; but none of them attain the limit of perpetual snow.

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[1] This town is situated on the Chagrin-gol, twenty-three miles below the spot where we crossed this stream, which is apparently a branch of the Tatung.

[2] This stream flows into the Chagrin-gol; we saw in its valley an image of Maidari, fourteen feet high, cut out of the rock.

We now passed through a belt of underwood, soon afterwards succeeded by forests which grow chiefly on the southern slopes; the upper zone was thickly covered with grass. New kinds of plants met our eyes at every step; almost every shot we fired added some fresh specimen to our bird collection; but we had no time to linger over these pleasures, so eager were our companions to reach their destination, and so fearful of Dungans. We could only make the best use of our opportunities as they presented themselves. To add to our difficulties the rain fell incessantly, and the atmosphere was saturated with moisture, rendering it impossible to dry our collections, which were consequently ruined by the damp; and even our guns were rusted by it.

After crossing the pass, the ascent of which is gradual and the descent only a little steeper, we encamped for the night in the mountains. Here another adventure befell us. Our Cossacks, who had gone to fetch wood, observed a fire burning in an adjoining ravine, and some men near it. On hearing this report everyone in camp was on the alert, imagining that they were robbers preparing to attack us by night. We determined to reconnoitre before it became quite dark, and accompanied by eight of the caravan, our friend Randzemba among the number, we cautiously approached the fire; but we were soon observed, and the enemy fled. The lamas at once pursued, yelling at the top of their voices, but owing to the thick underwood, and approaching twilight, could not overtake the fugitives. We all assembled round the deserted camp fire, on which stood an iron bowl containing food, with a bag of provisions lying near it. Judging from the small size of the cooking vessel that the party could not be numerous, and that after all they might not be robbers, our companions began holloaing in Mongolian, Tangutan, and Chinese to invite the strangers to return. The only response vouchsafed was a shot, fired from a clump of bushes on the brow of the hill, which whistled close by us. In return we fired about fifteen times in the direction of the smoke, the lamas joining in, and Randzemba of course taking a leading part. For a long while afterwards he could talk of nothing else but the breechloaders, and on returning to camp in answer to all questions put to him by his companions, he would exclaim, 'Ay lama, lama, lama!' vehemently shaking his head and wringing his hands to express his unutterable astonishment.

We determined to mount guard that night, and lay down to rest with our guns under our heads as usual. Hardly had I fallen asleep when I was roused by the report of a shot close to our tent, followed by a loud cry. Seizing our guns and revolvers, we ran to the door, and found that the sentry had fired into the air. 'Why did you do that?' I asked him. 'To let them know we are watching,' was the answer. The Chinese soldiers frequently did this, at least the militia assembled for the defence of Chobsen constantly wasted their ammunition in this way. The following day the whole mystery was explained. At dawn two Tangutan sportsmen appeared, asserting that they and their two companions had run away from us, that one of their party had fired supposing us to be Dungans, but that nothing had been heard of him since. They begged us to restore the bag of clothing which the lamas had appropriated as their legitimate spoil. These, however, not only refused to surrender, but thrashed the strangers soundly into the bargain, for their companion's impudence in having fired upon us!

On resuming our march, we fell in with an encampment of Tangutans, with their black tents and herds of long-haired yaks, called *sarloks* by the Mongols. After crossing some more spurs of the great range, we reached the bank of the Tatung-gol, and encamped for the night near the temple of Chertinton. The impregnable position of this temple saved it from falling into the hands of the rebels, and made it a secure place of refuge for the neighbouring Tangutan population. In the next chapter I will describe this people more fully; suffice it for the present to remark, that at first sight we were struck with their resemblance to gipsies.

The Tatung-gol, where we now approached it, about half way from its source, is a rapid stream 140 feet wide, flowing in a stony channel, in some places between precipitous walls of rock, but occasionally tered by enormous cliffs, stands the temple of Chertinton.

The superior of the temple, a Gigen (i.e. living Buddha) is a very remarkable man. On learning of our arrival he invited us to his house to drink tea and make his acquaintance. We gave him a stereoscope, with which he was delighted, and we soon became good friends. Unfortunately he was a native Tangutan, and could not speak Mongol; our conversation was, therefore, carried on through the medium of two interpreters, the Buriat-Cossack and a Tangutan. Our host was an artist and made a sketch of our first meeting with him.

The valley of the Tatung-gol is so deeply cut into the mountains that the elevation of the temple is only 7,200 feet, the lowest spot we visited in the district, although to the eastward, i.e. towards the Hoang-ho, the valley of its tributary is of course lower.

The fords of this river are only practicable at low water, and even then are very difficult: a bridge has, therefore, been thrown across it, two miles above the temple; but the gates at either end are too narrow to allow of the passage of loaded camels. We had, therefore, to unload our beasts, and hire Chinese to carry our things across. Here we pitched our tent, and remained five days, in consequence of the illness of the Cossack Chebayeff. Our companions could not wait so long, and left us to continue their journey to the temple of Chobsen, only forty-seven miles distant. Our compulsory five days' halt was very agreeable, enabling us to make excursions into the mountains, and to study their flora and fauna. The profusion of both one and the other made me decide on returning to this spot, and devoting the whole summer to the special study of the mountains round Chertinton.

We were told positively that our baggage animals could not pass the range on the right (southern) bank of the Tatung;[1] accordingly we left camels and horses, and hired Chinese to carry the baggage on mules and asses to Chobsen.

On July 1, we ascended one of the tributaries of the Tatung, the Rangta-gol, by a narrow path leading through a defile in which we saw the black tents and wooden huts of the Tangutans. The hills are well wooded up to their higher zones, which are covered with underwood. Enormous rocks rise on all sides and shut in the lateral defiles. The ascent was very steep, almost precipitous, and the beasts could hardly keep their footing. The view from the summit, however, is splendid, overlooking a wide uneven plain, which presented a remarkable appearance as we saw it, swathed in fleecy clouds with a bright sun and clear sky overhead.

The descent on the opposite side is short but abrupt,[2] leading to an extensive hilly region, on the outskirts of which is the town of Si-ning, at the foot of lofty snow-clad mountains. This is a well-cultivated and populous country, comprising the towns of Nim-pi and Ou-yam-pu, and further to the west, Si-ning, Tonkir, and Seng-kwan.

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[1] This information afterwards proved incorrect; pack-camels may cross the mountains, although with considerable difficulty.

[2] The ascent from the Tatung by the valley of the Rangta is twenty-three miles long, the descent on the south only six miles.

The inhabitants of this part of the province of Kan-su[1] are Chinese, Tangutans,[2] and Taldi, to the latter of whom I will for the present confine my remarks.

This tribe inhabits a comparatively limited district near the towns of Nim-pi, Ou-yam-pu, and Si-ning, and the temple of Chobsen, where they form half the numerical strength of the population. Externally they are more like Mongols than Chinese, although a settled agricultural people. Their faces are round, with flattened features, cheekbones prominent, eyes and hair black, mouth rather large, and figure thickset. The men shave beard and hair, leaving a pig-tail.[3] The girls plait all their hair into a long tress behind, and wear a tall square head-dress made of *daba* (cotton cloth), but the old women put nothing on the head, dividing the hair in front and braiding it behind. The dress of men and women is very like that of the Chinese, with whom, as well as with the settled Tangutans, they intermarry. They are Buddhists by religion.[4]

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[1] Kan-su is bounded on the north by Mongolia, on the east by Shen-si, on the south by Sze-chuan, while on the west, before the Dungan insurrection, it extended as far as Barkul and Urumchi in Eastern Turkestan.

[2] A description of the Tangutans will be found in Chapter IV. of this volume; the Chinese in Kan-su are the same as in other parts of the Empire; the Mongols only inhabit those districts lying near the sources of the Tatung, forming part of the Koko-nor administrative district.

[3] Unlike Mongols and Chinese, the Taldi can apparently grow beards.

[4] The following extract translated from Palladius' letter to Gen.

These are all the observations I could make of this people, of whom we saw little. The Mongols spoke in a disparaging way of their physical and moral qualities, and described their language to be a mixture of Mongol, Chinese, and words of their own.

The temple of Chobsen, which was the starting point of all our subsequent excursions, stands on the northern border of the hilly region which we have mentioned. It is forty miles NNE. of Si-ning, in 37° 3′ north latitude, and 100° 58′ east longitude from Greenwich, fixing the latter approximately by existing maps. Its elevation is 8,900 feet above the sea. The temple comprises a principal shrine, surrounded by a mud wall, and a number (perhaps 100) of smaller buildings, which were all destroyed by the Dungans three years before our arrival, the shrine alone, protected by its wall, escaping.

The temple is of brick, in the usual quadrangular

Vlangali, dated Peking, August 13, 1873, supplies further particulars about the Taldi : 'It is certain that in the last century a colony of Mahommedans, "turban wearers" from the western countries, settled near Si-ning ; probably in the course of time they became like the common Dungans, judging from those of the Si-ning Mahommedans who brought rhubarb to Kiakhta. As to the name of *Taldi*, I suspect that it refers to the general appellation of the emigrants from *Taltu*, or *Tartu* (the Chinese reading is uncertain), in the sixteenth century, and originated in the following way : when the inhabitants of Hami were hard pressed by the sultans of Turfan, the Ming Government built them a separate city 400 li from Suh-chau ; this city is mentioned in Chinese history under the name of *Kuyui-chen* (its extensive ruins and aqueducts are still visible), but the settlers themselves called it *Taltu*, in what language I know not; a short time afterwards the Turfanis advanced to Kuyui or Taltu and obliged its inhabitants to remove to Kan-su, where they simply called themselves "people of Taltu," without any other name to indicate the origin of their tribe. I offer this explanation merely as a suggestion founded on actual fact.' —M.

shape common to all Buddhist places of worship, the sides facing the four cardinal points; the entrance is by a triple gate on the south, opposite to which is a stone platform ascended by a flight of steps. The sloping roof is covered with sheets of copper gilt, adorned with dragons at the corners.

A copper-gilt statue (fourteen feet high) of Sakya-muni, i.e. Buddha, occupies a conspicuous place in the interior. The god is represented seated; before him a lamp is always burning, and pinchbeck vessels containing water, rice, and barley-meal stand near.

Along three sides are ranged on shelves a thousand lesser deities from one to two feet high, the attitudes of some of which are peculiarly grotesque.

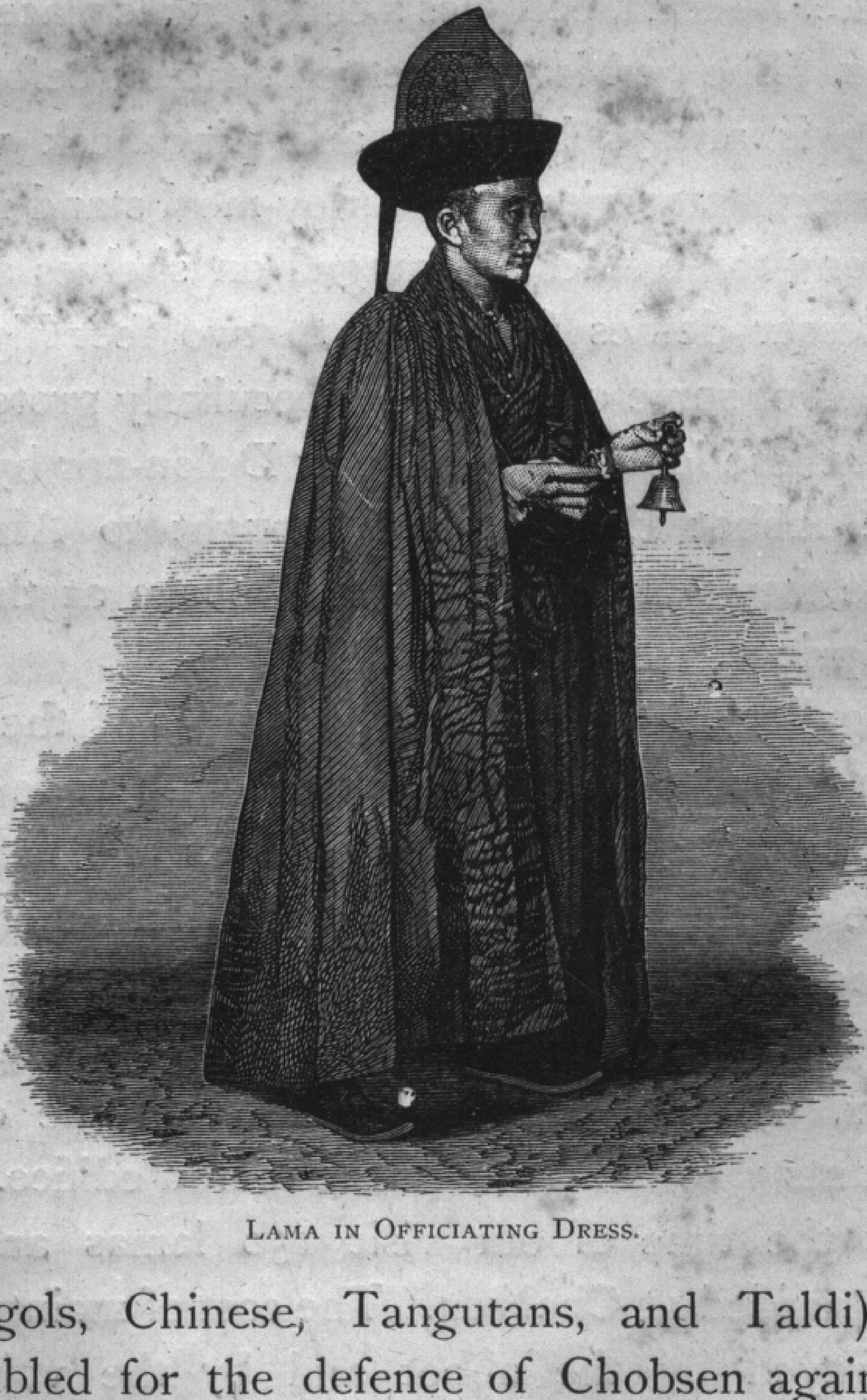
All these idols were made at Dolon-nor by order of the Abbot Djandji, and brought to Ala-shan, whence they were conveyed to Chobsen at the cost of the prince.

A gallery runs round the four sides of the court-yard, 100 paces each way, covered with rude paintings illustrating the exploits of gods and heroes, a strange medley of serpents, devils, and monsters; here too, at intervals of seven feet along the balustrade, are placed small iron urns, to contain the prayers, written on slips of paper, of the devout suppliants who daily attend the sacred edifice.

At the time of our visit 150 lamas and one Gigen resided at Chobsen. The cost of maintenance is defrayed by the abbot and by the voluntary contributions of pilgrims who are entertained on festivals with tea, milk, and roasted barley or

The latter is the universal food of all Tangutans and Mongols in Kan-su and Koko-nor. It is prepared in the simplest way: the grain is first roasted over the fire, then pounded in a mortar, and the meal thus prepared is boiled in tea and eaten instead of bread.

In addition to the lamas, a force of 1,000 militia



LAMA IN OFFICIATING DRESS.

(Mongols, Chinese, Tangutans, and Taldi), were assembled for the defence of Chobsen against the Dungans, whose territory was only ten miles off, and who were continually harassing the neighbourhood, riding up to the very walls of the temple in defiance of its badly-armed garrison. Four miles and a half to the east of Chobsen, another mud wall similar to the one on the borders of Kan-su, but even more dilapidated by time, extends, as we were assured, from Si-ning through Tatung to Kan-chau.

On our arrival at Chobsen the late companions of our journey welcomed us, and placed at our disposal a large empty house, formerly used as a store for idols. Here we spread out and dried our collections, which had seriously suffered from damp. But our occupations were constantly interrupted by sightseers, whose curiosity was excited by our herbs, &c., and it required all my prestige as a physician to allay their suspicions.

We stayed a week here preparing for an expedition to the mountains, where we intended passing the summer. Our purchases included four mules (for which we paid 110 lans), and a few small articles, which we had great difficulty in obtaining, owing to the stagnation of trade consequent on the unsettled state of the country. The currency too was very puzzling. Here a lan (tael) of silver was worth 6,500 cash; there were two unit weights—one being equal to sixteen lans, and another equal to twenty-four; in addition to the *tu*, the usual measure of solids, a new one called the *shing*,[1] containing five hings of dzamba or barley-meal, was introduced.

At length everything was satisfactorily arranged, and leaving the bulk of our baggage at Chobsen, on July 22, we started with four mules and two horses for the Tatung valley near Chertinton.

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[1] The *shing*, one-tenth of a *tu*, is in general use in China, but we first saw it at Chobsen. [The *tu* is equal to 12 lbs.—M.]

I must now make a short digression, in order to give a general sketch of the mountains in that part of Kan-su which we visited, viz. north and north-west of Lake Koko-nor.

The confined basin of this alpine lake is surrounded on all sides by mountains, forming a continuation of the ranges covering North-eastern Tibet, and the basin of the upper Hoang-ho. From this point, i.e. from the sources of the river, the system bifurcates, passing north and south of Lake Koko-nor, and continuing a long way to the west[1] forming a peninsula of high land defined on the south by the salt marshes of Tsaidam, and on the north by the vast plains of the Gobi. Towards the latter, as we have seen, the mountains form a rampart supporting the plateau, on which lie Koko-nor and Tsaidam, and separated from the still more elevated uplands of Tibet by the range of Burkhan Buddha.

Turning to Kan-su Proper, or rather to that part which we explored, we find it to consist of three parallel chains of mountains: one bordering the plateau on the side of Ala-shan, the other two piled upon the table-land, and following the course of the most important of its rivers, the Tatung-gol. On the east, as we approach the Hoang-ho, the mountains diminish in size, while on the west their elevation increases till they attain the limits of perpetual snow at the sources of the Etsina-gol[1] and Tolai-gol. Here all these ranges may possibly unite or throw out new branches, but in any case further to the west they again diminish and soon terminate, perhaps merging in the general upheaval of the Gobi.

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[1] We were told by the natives that this range continued for upwards of 300 miles to the west of Lake Koko-nor.

The whole of this mountainous system is known to the Chinese under the name of Siue-shan or Nan-shan ; but the several ranges have no special names, and, therefore, for the sake of distinctness I will use the terms '*northern*' and '*southern*' for the ranges on either bank of the Tatung, while that dividing Ala-shan from Kan-su shall be called the '*border range*,' without, however, the least intention of applying these names in the future.

The northern and southern chains bear a close resemblance to each other, and are equally wild and alpine ; they abound in deep narrow gorges, huge cliffs, and precipices. About the middle of the Tatung-gol a few solitary peaks rise to a height of 14,000 feet,[2] but without attaining the perpetual snow-line. The snowy mountains are, as we have mentioned, further to the west, near the towns of Lang-chau and Kan-chau, and at the sources of the Tatung and Etsina. One snowy peak, however, rises behind Si-ning.

Although the pass over the northern chain is less steep and rugged than that over the southern, the peaks on this side are the loftiest, including Mount Konkir,[1] which is covered with snow the whole year round. The highest mountains in either ranges are held sacred by the Tangutans under the name of *Amneh*, i.e. 'ancestors.' They are thirteen in number, situated about the middle and upper course of the Tatung, but the southern chain has only three, viz. *Chaleb*, *Bsiagar*, and *Kumbum-damar*. The sacred mountains of the northern range, taking them in the order in which they come, are *Mela*, *Konkir*, *Namrki*, *Chiskar*, *Rargut*, *Rtashtai*, *Shorun-tsun*, *Marntu*, *Djagiri*, and *Sienbu*.[2]

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[1] The R. Etsina, with its left tributary the Tolai, flows due north, watering the cultivated land in the vicinity of Kan-chau and Suh-chau, beyond which they enter the desert and discharge into Lake Sogo-nor.

[2] Mount Gadjur is in the northern range.

The geological formations are chiefly schistous clay, chlorite, limestone, felspar, gneiss, and diorite. The mineral wealth of this region consists in its coal-fields and gold, which, according to the natives, is found in almost every mountain stream; the coal-beds near Chertinton are worked by the Chinese.

According to the natives, shocks of earthquake are frequent and violent, but we only felt one slight shock.

The climate is exceedingly damp, especially in summer, part of autumn and spring; in winter, the people told us, that it was generally clear, cold winds alternating with calm warm weather. It rained constantly during the summer. We registered twenty-two rainy days in July, twenty-seven in August, and twenty-three in September; of the latter number twelve were snowy; from September 28, it snowed frequently. Owing to the heavy rainfall the soil is very moist, nearly every ravine having its stream. The temperature in summer is low, if it be remembered that this region lies in the thirty-eighth parallel. Even in July the greater heights were covered with hoarfrost; in August thick flakes of snow fell, thawing, however, during the daytime, and after the beginning of September the snow remained on the ground.

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[1] This mountain is situated at the sources of the Tatung, near Yunan-chen.

[2] I could not discover why Mounts Gadjur in the northern, and Sodi-Soruksum in the southern range, are not included in the number of the sacred mountains.

The heat in summer was never oppressive, the highest temperature registered in July being 88° Fahr. in the shade. Light winds prevailed from the SE., and thunderstorms were most frequent in July and September, in the latter month accompanied by snow and hail.

The flora is rich and varied, as one would have expected from the moisture and richness of the soil, and the other favourable conditions for its development. Forests, however, in our sense of the word, only grow on the northern slopes of the southern range: a circumstance deserving of notice, because in these mountains arboreal vegetation has not to contend with the disadvantages of an arid climate as in the mountains of Mongolia. Even in this moist atmosphere trees apparently avoid the sun, which certainly does not make its presence often felt during the summer. As usual, the lower zones are the most thickly wooded, from the bottom of the valleys up to 9,500 or 10,000 feet above sea-level. Here vegetation was most abundant. Fine tall trees, dense underwood, and a variety of flowers reminded us of the forests in the Amur country, and were rendered doubly grateful by contrast with the preceding aridity of the desert of Ala-shan.

On our first entrance into the forests we recognised many a flower and plant familiar to us at home, and descried also many new kinds never before seen. Among these the red-barked birch (*Betula Bhojpattra* ?) was most conspicuous, attaining a height of 30 to 40 feet, with a thickness of 1 to 1½ foot in the stem. The trunk is very like that of the common birch, excepting in its bark, which peels off and hangs from it in long festoons. The Tangutans use this, instead of packing paper. Close by grows our old friend the white birch (*Betula alba*), also conspicuous in the lower forests.

The aspen (*Populus tremula*) next attracts our attention, standing both solitary and in masses; the pine[1] (*Pinus Massoniana* ?), and spruce fir (*Abies obovata*), occasionally covering the hill-side; the spreading poplar (*Populus* sp.), and willow (*Salix* sp.), only growing in the valleys. The red mountain-ash (*Sorbus Aucuparia*), side by side with another kind (*Sorbus* sp.) with fruit of an alabaster white, looked very pretty, growing to a height of 14 feet. The arboreous Juniper (*Juniperus* sp.), 20 feet high, unlike other trees, is more often met with on the southern, i.e. sunny slopes, and at an elevation of nearly 12,000 feet among the Alpine shrubs. This tree is held sacred by the Mongols and Tangutans, who burn the branches for incense during prayer time.

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[1] It is not probable that this is *P. Massoniana*, which is a Japanese plant of lower elevation.—J. D. H.

The bushes are of course most abundant on the banks of the streams. Here we saw syringa (*Philadelphus coronarius*) in full bloom in June; two kinds of wild rose (*Rosa* sp.), one with white, the other red flowers; two kinds of barberry (*Berberis* sp.), one covered with thorns an inch and a half long; the Chinese elder (*Sambucus Chinensis*); gooseberry (*Ribes* sp.) in large bushes 10 feet high, with big yellowish bitter berries; a raspberry (*Rubus pungens*), with delicious fruit of a pale red colour; another raspberry (*Rubus Idæus* ?) similar to the European species, but only two feet high, growing on the exposed hill side in the zone of the alpine shrubs; and seven or eight kinds of honeysuckle (*Lonicera*), one yielding a long blue fruit, which is edible.[1]

Among the other bushes we may mention the Spiræa, black currant (*Ribes*), cherry (*Prunus*), spindle tree (*Euonymus*), wild pepper (*Daphne Altaica* ?), *Cotoneaster*, *Hydrangea pubescens*, and the *Eleutherococcus senticosus* found on the Amur. The *Lespedeza*, however, a native of the same country, is not found further than the Munni-ula, not being met with either in the Ala-shan or

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[1] Professor Maximovitch, of the Botanical Gardens, St. Petersburg, informs me that this species of honeysuckle nearly resembles the *Lonicera cærulea* of Siberia, which is also edible.—M.

Kan-su ranges; the absence of the hazel is equally notable.

The streams are frequently fringed with willow (*Salix* sp.), and tall buckthorn (*Hippophaë rhamnoides*) fifteen feet high; on the open mountain side are the hawthorn (*Cratægus* sp.), yellow camelthorn (*Caragana* sp.), and white *Kurile tea*[1] (*Potentilla glabra*).

Herbaceous plants are even more numerous. The wild strawberry (*Fragaria* sp.) is plentiful on the moist loamy soil; patches of moss are sometimes covered with pink flowers of a pretty *Pedicularis*; in the woodland glades many a bright peony may be seen, with a groundsel (*Ligularia* sp.), valerian (*Valeriana* sp.), meadow rue (*Thalictrum* sp.), geranium (*Geranium* sp.), columbine (*Aquilegia* sp.), winter-green (*Pyrola rotundifolia*), garlic (*Allium Victorialis*), great burnet (*Sanguisorba officinalis*), *Rubia Javanica*? *Prenanthes* sp., *Pleurospermum* sp., the clematis twining round the bushes, and the rosebay willow-herb (*Epilobium angustifolium*) adorning the grassy slopes with its rose-coloured flowers. Later in the season, towards the end of July, we found in the same localities the great yellow and twining wolf's-bane (*Aconitum lycoctonum*, and the *A. volubile*), larkspur (*Delphinium* sp.), tansy (*Tanacetum* sp.), the upright bitter-vetch (*Orobus Lathyroides*), feverfew (*Pyrethrum Sinense*), the creeping rooted elecampane (*Inula Britannica*), and the stinking bugwort (*Cimicifuga fœtida*). Ferns (*Polypodium vulgare, Adiantum pedatum, Asplenium* sp.) also abound in these forests.

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[1] The *Potentilla fruticosa* and *P. glabra* are known in Siberia under the name of *Kurile tea*; a name given to this plant owing to the circumstance of the inhabitants of Kamchatka and the Sea of Okhotsk infusing a beverage from its leaves.—M.

On the open hill-sides in the tree-belt grow varieties of saxifrage, red lily (*Lilium tenuifolium*), hyssop-leaved dragon's-head (*Dracocephalum Ruyschiana*), *Senecio pratensis*, *Schultiza* sp., *Allium* sp., *Gentiana* sp., *Ajuga* sp.

In the open valleys in spring we saw numbers of flowering Iris; and in summer: aster (*Aster artaticus*), common sorrel (*Rumex Acetosa*), Persicaria (*Polygonum polymorphum*), primroses (*Primula Sibirica*), forget-me-nots (*Myosotis* sp.), hare's-ear (*Buplearum* sp.), *Gentiana* sp., *Anemone* sp., *Artemisia* sp., *Melica* sp., *Elymus* sp., *Spodiopogon* sp.; *Lolium* sp.; *Ranunculus*, *Oxytropis*, and *Potentilla*.

One kind of the last-named flowers familiar to us under the name of wild tansy (*Potentilla anserina*), is called here *djuma*, and supplies an edible root, large quantities of which are dug up by the Chinese and Tangutans in autumn or spring. The roots are washed, dried, and then boiled in water, and eaten with butter or rice; they taste something like beans. A poisonous kind of grass (*Lolium* sp.) grows here and in the Ala shan mountains; it is called *Khoro ubusu* by the Mongols, and is very injurious to cattle, especially camels, the native herds carefully avoiding it.

But the most remarkable plant of the tree-belt is the medicinal rhubarb (*Rheum palmatum*), known to the Mongols as the *Shara-moto*,[1] and to the Tangutans as *Djumtsa*. As it has not yet been studied by European naturalists in its native country, I will describe it at some length.[2]

It has three or four large dark green leaves[3] near the root, from the centre of which springs the flower-stalk to a height of seven to ten feet, with a thickness of one-and-a-half inch near the ground.[4] Old plants have ten or more leaves, but the flower-stalks are in such case more numerous, the proportion of leaves being invariably three or four to each. The section of leaf-stalk is oval, about the thickness of a finger; the length of the leaf being twenty-six inches, colour underneath green, above reddish, covered with fine reddish hairs one-fifth of an inch long. The flower-stalk throws out a few small leaves at its joints, and the small white flowers are set on a second stalk branching from the main stem two-thirds of its height from the ground.

The root is cylindrical with a number of slender offsets,[5] the length and number of which depend on the age of the plant. When full grown the root is

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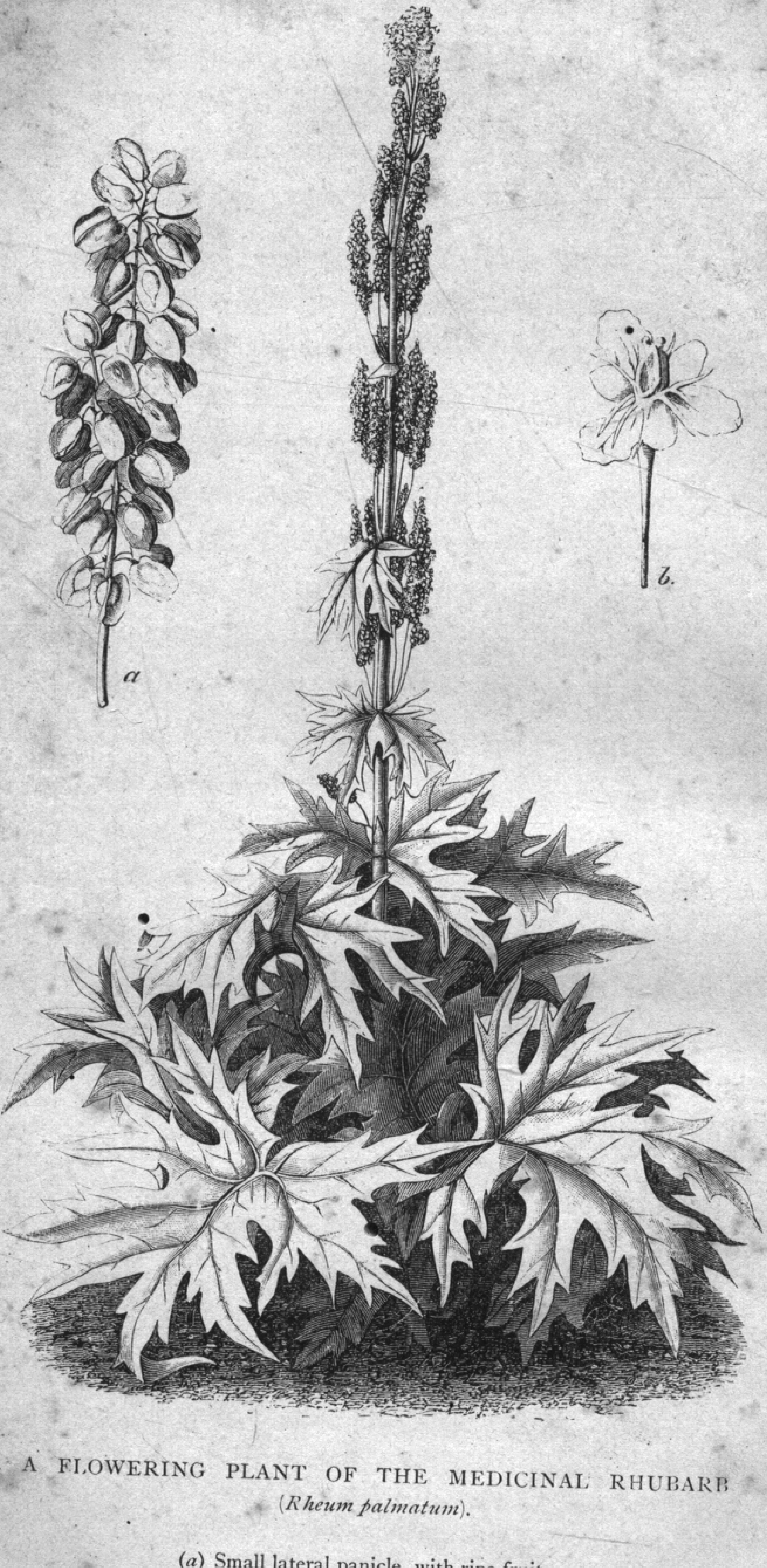
[1] I.e. yellow tree.

[2] Compare this and the following paragraphs with Marco Polo, speaking of the same region: 'Over all the mountains of this province rhubarb is found in great abundance, and thither merchants come to buy it, and carry it thence all over the world. Travellers, however, dare not visit these mountains with any cattle but those of the country, for a certain plant (*erba*) grows there, which is so poisonous that cattle which eat it lose their hoofs' (2d. ed., i. 219).—Y.

[3] The largest leaf we measured was two feet long by three broad.

[4] These are the dimensions of a full-grown plant.

[5] Old roots have as many as twenty-five offsets, the largest being in. in diameter, with a length of 21 inches.



A FLOWERING PLANT OF THE MEDICINAL RHUBARB
(*Rheum palmatum*).

(*a*) Small lateral panicle, with ripe fruit.
(*b*) A flower from which anthers have fallen off.

about a foot long and the same in thickness;[1] its exterior covering is a brown, rough rind, which is cut off when dry. The flowering time is the end of June or beginning of July; the seeds ripen towards the end of August.

The natives asserted that the root is fittest for medicinal purposes in spring and autumn, and that when the plant is flowering it becomes porous; but we did not find this to be the case in the specimens we obtained in midsummer. The Tangutans and Chinese dig it up in September and October; but the disturbed state of the country has almost put a stop to this industry, which at one time was so actively pursued that nothing but the inaccessibility of some of the forests could have preserved it from extinction. In the environs of Chertinton it is rare, but it is said to abound near the sources of the Tatung and Etsina further to the west, whence the largest quantities were formerly obtained, and transported to Si-ning, the chief central depôt for the rhubarb trade. During our stay in these parts the price averaged a lan (tael) of silver per ten hings (i.e. about 6½*d.* per hing).[2]

It is transported by land in winter, and by boats in summer down the Hoangho to Peking, Tien-tsin, and other ports, where the Europeans buy it, paying six or ten times more than its value at Si-ning. A large quantity used formerly to be sent to Kiakhta, but of late years the supply has ceased. The trade might be reopened by a well-equipped caravan provided with an escort of ten well-armed men.

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[1] Some few, however, are even larger.

[2] A hing is about ¼ lb.—M.

The first process in preparing the rhubarb is to cut off the lateral offshoots, removing the outer rind with a knife, and cutting the root into pieces, which are threaded on strings and suspended in the shade to dry, generally under the roof of a house, where the air circulates freely: if dried in the sun it is spoiled.

The plant grows at an elevation of 10,000 feet above the level of the sea, very rarely above that limit, and mostly preferring the ravines, with a rich loamy soil and northern aspect. It seldom grows on the southern slopes or on the bare mountain.

The Tangutans sometimes sow it in the gardens adjoining their dwellings, propagating it by means of seeds and young plants. It may be sown in autumn or early spring, but the soil must be fine, carefully sifted black mould. The third year after sowing the root is about the thickness of a man's fist, and in about eight or ten years it attains maturity. It is sown by the natives in small quantities as a medicine for themselves and their cattle. It is not cultivated largely, probably owing to the abundance of the wild plant. I feel certain that it might be successfully cultivated in many parts of Russia, as for instance on the Amur, the Baikal, the Oural, and the Caucasus; and experiments will probably be made with the seeds I brought home and sent to the Botanical Gardens.

It also grows in the mountains south of Lake

Koko-nor, in the snowy range south of Si-ning, and in the Yegrai-ula, near the sources of the Yellow River. We could not ascertain positively if it grows in the neighbouring province of Sze-chuan, but it is not found in Northern Tibet. Thus from all the information we could gather, it is limited to the alpine country of Lake Koko-nor and the sources of the Yellow River.[1]

Another kind (*Rheum spiciforme*)[2] is also found in the Kan-su mountains, where it only grows in the alpine region. This plant has a thin branched root about four feet long, but is unfit for medicinal purposes. It grows in the Himalayas and Thian Shan, and we often saw its withered leaves in winter in Northern Tibet.

We have already said that the forests grow 10,000 feet above sea-level; higher than this they are replaced by alpine bushes and by meadows; the rhododendra, of which we found four kinds—all pronounced to be new by the botanist Maximovitch

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[1] The above described plant is not the same as that which has lately been introduced into European gardens as the true rhubarb of commerce, namely *R. officinale*, Baillon (see Flückiger & Hanbury, 'Pharmacographie,' p. 442). The latter plant is a native of Mongolia, and is described by Bell, of Antermony, in his travels (vol. 1. p. 384–387). Several species are cultivated in Europe, and their roots are extensively used as substitutes for the Chinese plant, especially the *R. Rhaponticum*, in England, and *R. palmatum* itself, which has been grown on a large scale in Russia and elsewhere on the Continent, where, however, its central root proves liable to decay. It was long ago ascertained by the French pharmacologist, M. Guibourt, that the root of the cultivated *R. palmatum* approached most nearly to that of the imported plant.—J. D. H. [See Supplementary Note.]

[2] The Tangutans call this kind *zarchium*, and the Mongols *Kurmeh-shara-moto*.

—were most conspicuous. One variety, twelve feet high, and not deciduous in winter, with tough leaves and sweet-scented white blossoms, was particularly fine, and might also be seen in the forests below the alpine belt.

The other characteristic plants of this region are the *Caragana jubata* (the same species as in the Ala-shan mountains), the yellow kurile tea (*Potentilla tenuifolia*), spiræa (*Sp. Altaica*), and willow (*Salix* sp.), growing in thick moss (*Hypnum* sp.) chiefly on the northern slopes. It would be impossible in this brief sketch to do justice to the profusion and variety of the flowering herbs, which now grew in patches among the bushes now covered whole sides of the higher mountains. Amongst the plants we noticed a great many entirely new kinds. The most conspicuous were several kinds of poppy (*Papaver*), louse-wort (*Pedicularis*), larkspur (*Delphinium*), saxifrage (*Saxifraga*), gentians (*Gentiana*), *Ranunculi*, *Potentillæ*, garlic (*Allium*), Siberian aster (*Aster Sibiricus*), *Erigeron* sp., *Saussurea graminifolia*, *Leontopodium alpinum*, *Antennaria* sp., *Androsace* sp. In the interstices of the rocks grew different varieties of primroses (*Primula*), whitlow grass (*Draba*), fumaria (*Corydalis*), golden saxifrage (*Chrysosplenium* sp.), stonecrop (*Sedum* sp.), *Isopyrum* sp., *Arenaria* sp.; and among the loose detritus, wolf's-bane (*Aconitum* sp.), *Ligularia* sp., *Saussurea obvallata*, &c. All these herbs and shrubs blossom in the end of June, when the mountains are ablaze with the yellow kurile tea, red, white, and lilac rhododendra and *Caragana jubata*, with an occasional patch of bright red flowers. But this does not last long. In July the rhododendra and *Caragana jubata* cease blooming, and early in August the morning frosts nip many of the herbs.

The luxuriance of the alpine meadows is limited to an elevation of 12,000 feet. The temperature above this is too cold, and winds and storms of too frequent occurrence, to allow of the development of vegetation, which becomes more stunted the higher we ascend, until it disappears altogether, and nothing is left but bare rocks, with an occasional patch of moss and lichen. Here the scientific observer may find an admirable illustration of the wasting, irresistible power of time, as it gradually wears down the hardest rocks and reduces to insignificance the loftiest cliffs.

Here, too, amid the loose *débris*, springs take their rise, at first trickling in feeble runnels, half hidden beneath the stones, soon to unite with other streams and descend in torrents down the rocky valleys.

As regards fauna that of the Kan-su mountains is richest in birds; of mammals we only found eighteen kinds, and fish and reptiles were very scarce. The small number of insects and almost entire absence of reptiles is due to the unfavourable climate.

The mammals belong exclusively to three orders, carnivora, rodents, and ruminants. We did not see a single specimen of the *Insectivora* or *Cheiroptera.*

Large animals are few by reason of their falling a prey to the hunter, and the large population. However the musk-deer (*Moschus moschiferus*?), wild sheep (*Ovis pseudo-Nahoor*), deer (*Cervus* sp.), and pygargs (*Cervus pygargus*), are plentiful. The last-mentioned, although found in the Munni-ula, does not inhabit the Ala-shan mountains.

Among the rodents the most remarkable are the marmot (*Arctomys robustus*), abounding in these mountains at an elevation of more than 12,000 feet, a small kind of lagomys (*Lagomys Thibetanus*), very plentiful in exposed places, and another species only found among the rocks and detritus in the upper alpine zone. Blind rats (*Siphneus* sp.) are also plentiful on the lower ground. Here, too, may be seen the little field-mouse (*Arvicola* sp.), hares (*Lepus* sp.), and an occasional flying-squirrel (*Pteromys* sp.) in the forests, distinct from the Siberian species.

We have enumerated all the ruminants and rodents; it only remains to describe the carnivora. The only representative of the feline order is the wild cat (*Felis* sp.); there are neither tigers nor panthers. A small species of bear, a polecat (*Mustela* sp.), a badger (*Meles* sp.), a fox (*Canis vulpes*), and two kinds of wolves, the common one (*Canis lupus*), and another of a reddish colour, are found in these forests.

Birds are far more numerous than mammals—we counted 106 settled or nesting kinds and eighteen migratory. The former number is certainly large if we consider that it includes only five orders, *Rap-*

tores, *Scansores*, *Oscines*, *Columbæ*, and *Gallinaceæ*; of the *Grallatores* and *Natatores* only one species breeds here. The proportions of the representatives in each class are, however, very unequal, the warblers (*Oscines*) being far the most numerous; next in order come the *Raptores*, then *Gallinaceæ*, then climbers (*Scansores*), and *Columbæ* last of all.

The following table will at once show the distribution of the birds of Kan-su:—

	Settled and nesting	Migratory	Total
1. Birds of prey (*Raptores*)	12	2	14
2. Climbers (*Scansores*)	7	0	7
3. Warblers (*Oscines*)	74	5	79
4. Pigeons (*Columbæ*)	3	0	3
5. Gallinaceous (*Gallinaceæ*) . . .	9	0	9
6. Waders (*Grallatores*)	1	7	8
7. Webfooted (*Natatores*)	0	4	4
	106	18	124

On comparing the birds of Kan-su with those of Mongolia, we find as striking a difference between them as between their floræ—a fact accounted for by the contrast between the physical conditions of the two countries. Forty-three of these birds were foreign to Mongolia, and even more if we were to include the birds of the Munni-ula and Ala-shan ranges. The ornithology of Kan-su comprises Siberian, Chinese, Himalayan, and Thian-Shan birds.

Beginning with the *Raptores*, we first notice three kinds of vultures, the Snow-Vulture (*Gyps nivicola*),[1] the Black Vulture (*Vultur monachus*), and the lammergeier (*Gypaëtos barbatus*), the latter an inhabitant of Europe, the two former exclusively belonging to Asia. The Snow-Vulture is an immense tawny-coloured bird, measuring ten feet between the tips of the wings. These are the chief representatives of the birds of prey.

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[1] *Gyps Himalayensis*, Hume's 'Rough Notes,' p. 15.

Among the *Scansores* (climbers) no very remarkable kinds can be mentioned. Swifts (*Cypselus leucopyga*) build their nests in the rocks below; cuckoos (*Cuculus* sp.) and woodpeckers (*Picus* sp. *Picus Martius*) are heard in the woods; but the Japanese goatsucker (*Caprimulgus Jotaca*), so common in Eastern Asia, is not met with west of the Munni-ula.

We now come to the most numerous class, viz. the Warblers, comprising the large white-headed redstart (*Phœnicura leucocephala*), only seen on the banks of streams in company with the active dipper (*Cinclus Kashmirensis*), the Kamchatka ruby-throat (*Calliope Kamtschatkensis*), the small yellow-breasted bullfinch (*Pyrrhula* sp.), scarlet bullfinch (*Pyrrhula erythrina*), the rose-finch (*Carpodacus* sp.), the tiny wren (*Troglodytes Nipalensis*), several kinds of *Phyllopneuste*, and the blue magpie (*Pica cyana*). The *Pterorhinus Davidii* and *Trochalopteron* sp., nearly allied to the thrush family, sing very sweetly on the banks of the streams.

Three kinds of thrush (two I believe to be new species) inhabit the tall forests, all excellent songsters; here, too, we saw four kinds of titmouse (*Parus* sp.) hedge-sparrow (*Accentor multistriatus*), and great grosbeak (*Hesperiphona speculigera* [1]), the latter preferring the juniper bushes, the berries of which are its favourite food.

In the alpine region we found the red-winged wall-creeper (*Tichodroma muraria*), for ever climbing up the rocks; a large species of Carpodacus with a gay note, two alpine choughs (*Fregilus alpinus*, *Fregilus graculus*), the martin (*Chelidon* sp.), the velvety blue stonethrush (*Grandala cælicola*), the mountain pipit (*Anthus rosaceus*) and two kinds of hedge-sparrows (*Accentor Nipalensis*, *A. rubeculoides*), the former of which is a great songster. A little lower down, among the bushes were the beautiful lesser titmouse (*Leptopœcile Sophiæ*) of a metallic violet hue, the deep pink *Carpodacus rubicilla*, *Calliope pectoralis*, the reed-warbler (*Schœnicola* sp.), with long pink tail feathers; and in the open valleys the linnet (*Linota brevirostris*), *Montifringilla Adamsi*, and *Montifrilla* sp.

Among the *Columbæ* and *Gallinaceæ* in the alpine region we noticed the rock-dove (*Columba rupestris*); another kind of mountain-pigeon, the wary *Columba leuconota*, among the wildest and most inaccessible cliffs of the upper zone; the great snow-partridge (*Megaloperdix Thibetanus*), called *Kunmo* by the Tangutans, and *Hailik* by the Mongols. Not far off, in the clumps of rhododendron and caragana, the dusky Impeyan grouse (*Tetraophasis obscurus*) and partridge (*Perdix* sp.), distinct from the Mongol species. In the lower tree-belt the gallinaceous order was represented by a new kind of tree-partridge (*Bonasia* sp.) larger than ours with darker plumage; the rare *Itaginis Geoffroyi*, the pheasant (*Phasianus* nov. sp.), and the tufted species (*Crossoptilon auritum*), a splendid bird, with plumage of a leaden colour, which had attracted our attention in the Ala-shan mountains.

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[1] *H. carneipes*, Hodgs.

None of the waterfowl breed in the mountainous region of Kan-su, and birds of passage are rare; we only found one kind of wader (*Ibidorhynchus Struthersii*) in the pebbly beds of watercourses.

On re-entering the mountains near Chertinton, we moved from place to place, always selecting the most favourable ground for encamping, and stayed as long as was necessary in one spot. The daily rains and excessive humidity greatly interfered with our pursuits, increasing the difficulty of drying our plants and skins, and obliging us to seize every opportunity afforded by the short intervals of fine weather for the preservation of our collection.

The constant rains in the alpine zone were often accompanied by snow and frosts at night; the birds, too, were all moulting at this season, and hardly ten per cent. of those we shot were fit for preserving. But the plants, at all events in July, were in full flower, and we secured 324 varieties out of 3,000 specimens; whereas we obtained only 200 birds. Insects were very scarce, not only in the alpine region, but even in the lower ground. This was certainly a drawback to our entomological collection; on the other hand, we felt grateful for being spared the plague of mosquitoes and flies, from which I had experienced such tortures during my wanderings in the forests of the Amur.[1] We could not spare time to hunt large game, which is scarce; and during the whole of our stay here I only shot two wild sheep, which, with two small yaks bought of the Tangutans, supplied us with provisions.

Rainy weather continuing incessantly for days together caused us great discomfort, obliging us to sit idle in our tent without even a sight of the mountains, which were thickly shrouded in mist. Now and then we marched into the midst of a thundercloud, and the lightning played all round us. The moisture inside our tent was also very troublesome; although our guns were wiped every day, half the Snider cartridges missed fire owing to the damp.[2] The weather only became clearer on the lower ground, and in the valley of the Tatung.

Here we really felt the heat, although the water in all the streams was too cold for bathing.

We passed several days on the southern border of the southern range, before crossing to the other side, where we encamped near Mount Sodi-Soruksum, considered to be the highest of these mountains. Taking advantage of some clear weather, I made the ascent, wishing to ascertain its height by boiling water. After climbing 3,000 feet above our camp, I gained the summit, whence I had a magnificent view. The valley of the Tatung, with its tributary streams hurrying to join it on all sides, the northern range and the snowy peaks far to the westward, combined to produce an effect indescribably beautiful. I had never been so high before; at my feet were great mountains covered with wild crags and clothed with forests, through which wound rivers like silver threads. For a long while I could not tear myself away from the spot, but remained as one entranced, and shall remember that day as one of the happiest of my life.

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[1] Lieut.-Col. Prejevalsky travelled in the Amur and Ussuri country between the years 1867–1869, and he has published an interesting narrative of his experiences in those regions.—M.

[2] It was so damp that we could not make the fire burn without using a hand-bellows, which are in general use among the inhabitants.

In the hurry of starting I had left the matches[1] behind, and could not strike a light by the flash of my gun. I had, therefore, to defer taking the altitude for two days, when I again ascended the Sodi-Soruksum with the boiling-water apparatus complete, determined this time to discover the secret; a few minutes after lighting the spirit lamp I found it to be 13,600 feet above the sea. This is below the limit of perpetual snow, only a few patches being visible under the rocks, where the sun's rays did not penetrate.

After passing July in the mountains on the southern side of Tatung-gol, we crossed in the early part of August to the northern range and pitched our tent at an elevation of 12,000 feet, at the foot of the gigantic peak of Gadjur. Here we remained about a fortnight, rain falling incessantly, and on the 7th and 9th of August snow fell in such quantities as to lie on the ground and form considerable drifts. Under these circumstances scientific investigations could not be successfully prosecuted; the flowering season was nearly over, and only forty of the plants collected by us during the summer were gathered in August.

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[1] These matches, of Viennese manufacture, are sold by the Chinese all over the Empire.

The summit of Gadjur is crowned by some huge cliffs, in whose bosom reposes the small lake of Demchuk.[1] This lakelet is 700 feet long and 240 wide; the access is by a narrow chasm like a gateway. The lake itself is held sacred by the Tangutans, and prayers are offered up here by the common people as well as by the lamas of Chertinton. Their superior, our friend the Gigen, lived for seven years in a cave on the lake, and told us that he once saw a large blue cow rise from it, swim on its surface for some time and again disappear in its depths. Ever since then it has been held in high repute.

The absolute elevation of Demchuk is 13,100 feet, and the situation is very striking. The narrowness of the gorge, the tranquil gleaming waters, the gigantic rocks towering up all round, only admitting one small streak of sky, and lastly, the solemn silence almost unbroken save by an occasional falling stone, move the inmost soul of man. As for myself, I remained more than an hour on its shore absorbed in reverie; and when I left I felt how naturally the untutored mind might invest with mysterious sanctity so quiet a spot. I visited another small lake, called Kosin, near the summit of Sodi-Soruksum, also formed by springs; but its situation is more exposed, and it is not surrounded by the same mystery as Gadjur. Kosin, however, is also held sacred ever since the spirit (good or evil, I know not) drove from the spot a Tangutan hunter, attacking him under the form of a grey yak;[1] since which time sport is strictly prohibited on this and the other sacred mountains (Amneh).

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[1] There are actually two little lakes, but one is much smaller than Demchuk, and lies below it.

According to another tradition, Mount Gadjur was sent hither by some Dalai-Lama to impress the minds of the people with the wonders of the holy country (i.e. Tibet).

Its precipitous cliffs, composed of felspar, limestone, and schistous clay, rise to about 1,000 feet above Lake Demchuk; it is, therefore, higher than Sodi-Soruksum. However, I only saw a few patches of melted snow in sheltered spots on the northern side.

On the south of the Tatung the Tangutan[2] population is very thick in certain districts less exposed to the marauding Dungans, as for instance, round the temple of Chertinton, but in the northern range towards Mount Gadjur not a human being could be seen. Pillaging parties frequently passed here on their way from the town of Tatung[1] to plunder in Eastern Kan-su; and so great was the terror they produced that nothing would induce the Mongol whom we hired at Chobsen to accompany us to Gadjur, until we took another Tangutan guide well acquainted with the country, when the two, after holding some parley together in their own language, consented to proceed. I think they mutually agreed to desert in case we were attacked; but as we never trusted to the assistance of our guides in case of danger, this would not have made the slightest difference to us. Our fame as marksmen, and the reports of our wonderful guns, which had spread far and wide, were of much greater importance. I was regarded as a magician, whom no bullet could harm, and I, of course, took care not to undeceive them. We were always on the alert, however, and kept watch in dangerous places. We never held intercourse with the natives after dark for fear of admitting an enemy unawares. But we were not molested, although bands of robbers frequently passed our camp, and must have known of our whereabouts.

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[1] It is curious that in the popular legends of this people 'grey' cows, yaks, &c. take as prominent a part as they do in the popular legends of Russia.

[2] Eight miles below Chertinton some agricultural Chinese have settled in the valley of the Tatung; this colony escaped the Dungan ravages.

After the middle of August animal and vegetable life rapidly declined, and by the end of the month autumn had set in. The leaves were yellow, and the fruit of the mountain-ash and barberry adorned the ravines. The grass had withered, and only a few solitary flowers were left. One after the other the gay birds disappeared in search of a warmer climate and more abundant food in the lower valleys.

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[1] This town stands on the Tatung-gol, sixty-seven miles above the temple of Chertinton.

The scientific harvest was all gathered, and we determined to retrace our steps to Chobsen, and attempt to proceed thence to Lake Koko-nor. On our way back we caught our camels, which had been allowed to pasture near the temple of Chertinton, and were in miserable condition, owing to the unaccustomed food upon which they had fed all summer. They all had bad coughs, brought on by the damp climate, and their bodies were covered with sores; in fact they were hardly fit for even a short journey.

On September 1, we arrived at Chobsen, where we found that during our absence the Dungans had increased their marauding to an alarming extent. The badly-armed militia, numbering 2,000 men, could do nothing against the mounted robbers, who rode up to the very walls of the temple and taunted its defenders: 'Where are your Russian friends now with their good guns?' they would exclaim; 'we have come to fight them.' The militia sometimes returned a volley, but the bullets from their matchlocks fell short of the enemy. Our friends, the leaders of the caravan, were the chief organisers of the defence. They had sent several messengers into the hills imploring us to return, and were anxiously awaiting our arrival. Now, we thought, at all events we shall have a brush with the brigands; as for their leader, who was described by the gallant defenders of Chobsen to be a terrible warrior, who rode a piebald horse and bore a charmed life, we determined to try the effect of a Snider or Berdan bullet on him.

Our situation, however, was one of great danger. The temple, already inconveniently crowded, could not accommodate us and our camels. We, therefore, were obliged to encamp about half a mile off in an open grass plain. Here we took every precaution against attack. All the boxes containing our collections, the bags with supplies and provisions, and the pack-saddles were formed into a hollow square, within which we could retreat. Here stood our rifles with bayonets fixed, and near them piles of cartridges and ten revolvers. Before night all the camels were made to lie down and tethered round our improvised fortification, their ungainly bodies forming an additional protection against a mounted enemy. Lastly, to prevent waste of ammunition, we measured the distances on all sides, marking them with piles of stones.

The first night all the natives retreated within the temple, and we remained quite alone face to face with the robbers, who might appear at any moment in hundreds, or even thousands, and overpower us with their superior numbers. The weather was fine, and we sat for a long while in the moonlight talking over old times, our country, and friends whom we had not seen for so long. About midnight three of us lay down to rest, of course without undressing, leaving one to keep watch till morning. The following day passed as quietly as the first. The robbers had vanished, and even the miraculous warrior did not appear. The third day was a repetition of the two preceding, and the inhabitants of Chobsen, taking courage, drove their cattle out of the enclosure of the temple, and allowed them to graze near our camp.

Such is the moral superiority of the European over the degraded inhabitants of Asia; such the impression produced by the resolution, energy, and unwavering courage of a superior race.

We remained at Chobsen for six days exposed to unavoidable danger, which in the end opened to us a way to Lake Koko-nor.

The direct road to the lake passes through the towns of Seng-kwan[1] and Tonkir, by which it takes five days to reach its shores; but, owing to the occupation of Seng-kwan by Dungans, we had to abandon this route for some other more practicable. We fortunately succeeded in finding one.

On the third day of our halt three Mongols arrived at Chobsen from the banner of Mur-zasak, near the sources of the Tatung, having driven a flock of sheep, under cover of the night, over the mountains for sale. These men were obliged to return home soon and might serve as excellent guides for us, if we could induce them to accept our offers. With this view I addressed myself to our friend the treasurer of the temple, giving him a handsome present. Moved by this bribe, the lama persuaded the newly-arrived Mongols to act as our guides to their country, i.e. to Mur-zasak, receiving thirty lans (about 7*l.*) in payment for a distance of not more than eighty-eight miles.

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[1] The local Mongol name of this town is Mu-paishinta.

The principal objection which presented itself to their dull brains was the impossibility of travelling by night with pack-camels over the mountains; and if we attempted moving by day the probability of encountering Dungans, who pass continually between Seng-kwan and Tatung. Our perilous encampment near Chobsen was now of service to us. 'Fear not the robbers with these people,' said our friend the treasurer to the Mongols; 'look at us with 2,000 men shut up in our temple, and they only four in number in the open plain, yet no one dares to touch them. Think you that ordinary folk could have done that? No! the Russians know everything beforehand, and their captain is a great magician, or a great saint.' This argument, backed up by so tempting a bribe as thirty lans of silver, finally overcame their scruples, and they declared their readiness to show us the way, begging us first to consult the auguries in their presence as to the most favourable day for setting out on the journey.

Having made some observations for ascertaining the sun's altitude, in order to fix the latitude of Chobsen, and the magnetic declination, I announced that it was necessary to postpone our departure for a few days. This delay was indispensable, to enable us to store all our collections in a place of safety at Chertinton, because Chobsen might be taken in our absence, by the Dungans. The Mongols, who con sulted their auguries with a similar result, were well content to delay the start, and expected that in a few days the marshes would be frozen over. We held a council and fixed our departure for October 5, till which day we determined to keep our plans secret. The guides received ten lans as earnest-money, and retired to Chobsen, while we returned into the mountains, and encamped on the southern edge of the southern chain, whence my companion rode to the temple of Chertinton and delivered the boxes containing our collections into the charge of the gigen of that place.

Our twelve days' halt on the southern chain of the mountains was almost unproductive of scientific results ; for no forests grow on the southern slopes of these mountains, and the alpine zone is almost without a flora ; besides which many of the mountains were in their higher parts covered with snow and rain, and hail-storms occurred daily. The chief flight of birds took place in the first half of September, and on the 16th of that month large flocks of cranes, passing at such a height as hardly to be visible, directed their flight southwards.

Meanwhile the Chinese troops had begun operations against the Dungans at Si-ning, having marched into Kan-su 25,000 strong in July that year, and established themselves at Nim-pi and Ou-yam-pu. In the next chapter I will describe their operations before Si-ning; suffice it for the present to remark, that in consequence of orders which had been issued prohibiting the sale of provisions to anyone except the troops, we had great difficulty, even with the assistance of our friends, in procuring supplies. And of these we required enough to last us the whole winter, for it was generally reported that no provisions could be obtained at Koko-nor.[1] Our supplies, however, were at all times limited by our slender resources, and the only provisions procurable were dzamba (barley-meal) and coarse wheaten flour. We bought about seven cwt. of each, and we had also about 1½ cwt. of rice and millet left over from our Ala-shan stores, making four camels' loads in all.

A few days before our departure for Koko-nor, the caravan of Tangutans with which we had travelled to Chobsen returned to Peking, and we availed ourselves of this opportunity to send letters and official reports. In them I announced my intention of starting for Koko-nor, which I hoped to reach; but I added that we could not proceed thence to Lhassa in Tibet owing to the want of funds.

At last the wished-for day drew near, and in the afternoon of October 5 we left Chobsen. As I have stated, our road lay over the mountains between the Dungan towns of Seng-kwan and Tatung, by footpaths almost impracticable for our enfeebled and suffering camels. We therefore divided the baggage among all the pack animals, taking in addition one of the mules which we had used for the summer excursion.

The first short march was satisfactorily accomplished, but the following morning, not far from the temple of Altin, an adventure befell us. Our guides had warned us that this was a dangerous place, owing to the patrols of Chinese soldiers, who plundered friends or foes indiscriminately. We replied that it was quite the same to us, and that our bullets would serve for Chinese as well as Dungans. Their information proved correct. No sooner were we in sight of the temple than thirty mounted soldiers suddenly appeared, and after firing a few shots into the air charged our caravan with fearful cries. When they were within 500 paces I told our guides to motion to them and warn them that we were not Dungans but Russians, and that we would fire if they attacked us. Probably misunderstanding these explanations, the Chinese continued to advance at a gallop to within 200 paces of us, and we were on the point of firing. Fortunately, the affair passed off peaceably. Observing that our guns were at the ready, and that we were not in the least alarmed by their cries, they halted, dismounted, and came towards us, declaring that they had made a mistake, and had taken us for Dungans. This was of course a mere excuse, as the brigands never ride camels; and if we had shown fear and run away we should doubtless have been plundered. A few miles further the same adventure was repeated with some more Chinese, who retired empty-handed.

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[1] This proved to be a false report, as we had no difficulty in buying barley-meal at the encampment of the Wang (prince) of Koko-nor.

Our third day's march was the most dangerous, for we had to cross two high roads leading between Seng-kwan and Tatung. We passed the first successfully, but from the summit of the pass leading to the second we could see, at a distance of upwards of a mile, about a hundred mounted Dungans escorting a flock of sheep. On observing us they fired a few shots and closed the defile through which we were marching. The effect of this manœuvre on our guides was astonishing. Paralysed with fear, they muttered their prayers in a trembling tone of voice, imploring us to return; but we knew very well that retreat would give courage to the enemy, who could easily have overtaken us on their horses; and we therefore determined to force a passage. We were four well-armed and resolute men: as we marched ahead of our caravan, the guides followed with the camels, and were only prevented from deserting by our threat of shooting the first who turned back. The danger was great, but there was no help for it, and we had full confidence in the excellence of our arms and the well-known cowardice of the Dungans.

Our calculations proved correct. On observing our forward movement, the Dungans fired a few more shots, and before we had approached within range fled to either side of the high road at right angles with our advance. Leaving the defile, we crossed the road and began the ascent of a very steep high pass. To add to our difficulties night came on and a violent snow-storm overtook us, rendering it extremely difficult for the camels to keep their footing. The descent was even worse; we had to feel our way down in the dark, stumbling and falling at every step. After an hour's advance, we halted in a narrow defile covered with brushwood, where we had the utmost difficulty in pitching our tent and lighting a fire to warm our benumbed and bruised limbs.

The following five days' journey passed without any adventure, and we reached Mur-zasak in safety. This station is on the bank of the Tatung, only eight miles from the Dungan town of Yunan-chen; but, notwithstanding the evil repute of his rebel neighbours, the Mongol commander lived on the best terms with them, selling them cattle and taking their merchandise in exchange. Thanks to the letter of the treasurer of Chobsen, describing me as a personage of exalted rank nearly related to the Emperor, we obtained two guides to the next Tangutan station; of course not without presents to the commander and handsome pay to the guides.

The road now ascended the left bank of the Tatung, and was much better than the one we had come, the only obstacle to our progress being the daily fall of snow, which made it very muddy and slippery for our exhausted camels. The Tangutan officer at the station (twenty-seven miles from Mur-zasak) was an excellent fellow; on receiving five yards of plush and 1,000 needles, he sent us a sheep and ten pounds of yak butter. We stayed a day with him, and, having obtained new guides, left the valley of the Tatung on our way southwards towards Lake Koko-nor.

The basin of the Upper Tatung is very mountainous and wild, the two chains of mountains continuing to be distinctly defined on either bank, while some lateral spurs of the southern range form the watershed between some tributaries of the Tatung and the streams flowing into the Siling-gol and Koko-nor; the largest we crossed was the Buguk-gol, a tributary of the Siling, flowing through a beautiful valley.[1] The northern range makes a sudden bend to the north, near the town of Yunanchen, towards the sources of the river Etsina, where the mountains are higher and more rocky, culminating in the snowy peak of Konkir, one of the sacred mountains of the Tangutans.

The southern range between Chobsen and Murzasak is covered with dense underwood on its northern slopes, with an occasional spruce fir in the valley of the Buguk-gol; the southern slopes abound in rich pasture land. Beyond Mur-zasak, in the direction of the sources of the Tatung, and after crossing the watershed between the basin of this river and Koko-nor, the character of the scenery changes; the mountains are lower (excepting those in the main range) less steep and rocky, and the valleys marshy. The only shrub is the yellow kurile tea, in some places covering large areas. In fact, everything betokens the approach to the steppes of Koko-nor, which we entered on the 24th of Oct., and the following day we pitched our tent on the shore of the lake.

The dream of my life was accomplished, and the object of the Expedition gained! It is true that this success had been purchased at the cost of many hardships and sufferings; but all past trials were forgotten, as we stood in triumph on the shore of the great lake, and gazed with admiration on its beautiful dark blue waves.

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[1] It is of interest to see this name *Siling* applied apparently to the river running by Sining-fu. See Supplementary Note.—Y.

CHAPTER IV.

THE TANGUTANS AND DUNGANS.

Tangutan territory—The people—Characteristic traits—Stature; appearance; mode of wearing hair—Kara Tangutans—Language; dress; habitations—Black tents and wooden huts—Occupations—The domesticated Yak—Its different uses—Nomadising habits—Contrast between Mongols and Tangutans—Industry; food; dirt—Tonkir, a trade centre—Avarice—Polite customs—Monogamy—Religion—Government—Dungans or Mahommedan rebels—Their temporary success—Chinese towns fall into their hands—Revolt becomes brigandage—Opportunities neglected—Causes of non-success—Cowardice of rebels and of Chinese—Inefficient weapons—Siege of Chobsen—Commercial relations between belligerents—Measures of Chinese Government—Chinese soldiers—Bad arms—Want of discipline—Opium smoking—Looting—Government defrauded—Desertion—Punishment—Low morals—Mode of fighting—State of Affairs in Kan-su—Chinese take the offensive—Advance on Si-ning—Assault of this town—Marriage of Emperor of China—Siege operations suspended—Cowardice of besieged—Capture of Si-ning and advance westwards—Tangutan vocabulary.

THE Tangutans, or the Si-fan as the Chinese call them, are of the same race as the Tibetans.[1] They inhabit the hilly region of Kan-su, Koko-nor, Eastern Tsaidam, and the basin of the Upper Hoang-ho, and are met with as far as the Murui-ussu,[2] and perhaps beyond it. They regard these countries, to which they apply the name of Amdo, as their own peculiar territory, although they are here mingled with Chinese and Mongols.

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[1] The ancestors of the present Tibetans were Tangutans who removed to Tibet from Koko-nor in the fourth century B.C. See Father Hyacinthe's 'Statistical Description of China,' Part II. p. 145.

[2] I.e. the Tibetan course of the Kin-sha Kiang, which eventually becomes the Great Yangtse-Kiang.—Y.

Externally they present a marked contrast to the two last-named races, and, as we have already said, somewhat resemble gipsies. In height they are above the average, with thickset figures and broad shoulders; their hair, whiskers, and beard invariably black; the eyes dark and rather large, never narrow like those of the Mongols; the nose in general straight, although sometimes aquiline, and also sometimes turned up; the lips thick and protruding; the cheekbones not so prominent as in the Mongol type; the face long, never flat; the skull round; the teeth white and regular; the skin tawny coloured; the women smaller and darker in complexion than the men.

Unlike Mongols or Chinese, the Tangutans have a strong growth of beard and whiskers, which they always shave as they do the head, leaving a pigtail; the lamas, however, like the Mongols, shave the head clean.

The women wear long hair, parted in the middle, and divided into a number of small plaits on either side, adorned with different articles of finery, such as beads, ribbons, &c. They tinge their cheeks with Chinese dyes, and in summer with the juice of the wild strawberry, which abounds in the forests. This custom only prevails in Kan-su, not in Koko-nor or Tsaidam, probably on account of the difficulty of obtaining the necessary colouring matter.[1]

Such is the outward appearance of the Tangutans of Kan-su. Those of another branch known as Kara- (or black) Tangutans, inhabiting the basin of Koko-nor, Eastern Tsaidam, and the sources of the Yellow River, are distinguished by a greater stature, darker complexion, and especially by their predatory habits; these again wear no pigtails, shaving the head clean.

Our studies in the language were pursued under extraordinary difficulties, owing to the want of an interpreter, and the suspicious character of the people. If we had written down a word while conversing with one of them we should never have learned anything again; the report of our having done it would soon have been circulated in the neighbourhood and would have excited endless suspicions. My Cossack interpreter, at the best a very indifferent dragoman, did not know a syllable of Tangutan, being able only to hold a conversation with such natives as understood Mongol, and these are met with rarely.[1] There was more chance of finding a Mongol who spoke Tangutan, and such a one we succeeded in obtaining for our summer trip to the mountains. But to carry on conversation through the medium of two interpreters is a tedious and irksome business. I usually spoke in Russian to the Cossack, who interpreted into Mongol, the Mongol in his turn rendering the meaning into Tangutan.

Ladakh; at least if the custom here referred to is the same which Huc describes (ii. 254) at Lhassa, where he says the women rub their faces with 'a sort of black sticky varnish much like grape jam.'—Y.

[1] Nearly all Tangutans in Kan-su speak Chinese.

Allowing for the limited intelligence of the Cossack, the stupidity of the Mongol, and the suspicion of the Tangutan, some idea may be formed of our difficulties in studying the language. Now and then, while speaking with a native, an opportunity would present itself of jotting down a few words unobserved; but progress under these circumstances, in a language so entirely strange to Europeans, was almost hopeless.

The Tangutans have a way of pronouncing their words very rapidly, and their language is characterised by the following particulars :—

A large number of monosyllabic words pronounced abruptly: e.g. *tòk* (lightning), *ksiù* (water), *rtsà* (grass), *ksià* (hair).

The union of several consonants : e.g. *mdzugéheh* (fingers), *námrtsah* (year), *rdzávah* (month), *lâmrtonlamá* (paradise).

Vowels at the end of words are often lengthened out : *pchi-i* (mule), *sha-a* (meat), *tzia-ŭ* (tea), *veh-é-é* (husband), *siyà-a* (hat) ; or in the middle of words : *sa'azyuyu* (earth), *dóoa* (tobacco.)[1]

The final *n* is often drawn out and pronounced through the nose : *lun*(*g*) (wind), *shan*(*g*) (forest), *siúbchen*(*g*) (brook) ; words ending in *m* have an abrupt sound, as in *lam* (road), *onám* (thunder). The letter *g* at the beginning of a word is pronounced like the Latin *h* : *hóma* (milk) ; *k* is sometimes aspirated and pronounced as *kh* : *khi'ka* (range), *diudkhúk* (tobacco-pouch) ; *ch* like *tsch* : *tscho* (dog) ;

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[1] Is this not the Hindi *dhua*, smoke, showing whence tobacco was

r at the beginning of words when joined to one or more vowels is almost inaudible: *rgáamu* (wife), *rmúkha-a* (cloud).

The dress of the Tangutans is of cloth or sheepskins, suitable to the climate, which is very damp in summer and cold in winter. The summer costume worn by men and women consists of a grey cloth coat, or long tunic, reaching down to the knees, Chinese or home-made boots, and a low-crowned broad-brimmed felt hat. Shirts and trowsers are never worn, and in winter the sheepskin cloak is put on next to the skin; the upper part of the legs is usually bare. The richer persons wear robes made of Chinese daba (cotton cloth), but this is considered a luxury; the lamas have the usual red or, more rarely, yellow dresses. Their clothes are far inferior in texture to those of the Mongols, and the silken robe, so frequently seen among the Khalkas, is quite the exception here. But whatever the garment or the season of the year, the Tangutan always lets the right sleeve hang down empty, leaving the arm and part of the breast on that side exposed; a habit maintained even on a journey, weather permitting.

The smartest among them trim their coats with fur of the Tibetan panther, and wear a large silver earring set with a sapphire in the left ear; a tinder-box and knife stuck into the belt behind, and a tobacco-pouch and pipe on the left side, are worn by all. The inhabitants of Koko-nor and Tsaidam carry long Tibetan swords, made of very inferior metal, although very expensive; the price of the cheapest being three or four lans (15*s.* to 21*s.*), and the best costing as much as 15 lans (about 4*l.*).

The dress of the women is precisely the same as that of the men, with the sole difference that on holidays they wear wide handkerchiefs thrown over their shoulders, studded with shells, and those who can afford it are particularly fond of red beads.

The characteristic habitation of the Tangutan is his black tent, made of coarse woollen cloth,[1] supported at the corners on four poles, and fastened to the ground at the sides with loops. In the middle of the roof, which is nearly flat, there is an oblong slit about a foot wide to allow of the escape of smoke, closed during rain and for the night. In the centre of the tent is placed an earthen hearth; opposite the entrance are ranged the *Lares* and *Penates*, and on either side the implements and various domestic utensils of its inmates.

In the richly-wooded districts of Kan-su, where the Tangutans live with the Chinese and cultivate the soil, the tents are replaced by wooden huts, which are very similar, although even inferior, to those of White Russia,[2] having no wooden floors, and having the interior walls of the rough round timbers, the interstices being filled with clay; the roofs are flat, made of branches covered with earth, with a hole left in the middle to answer the double purpose of chimney and window.

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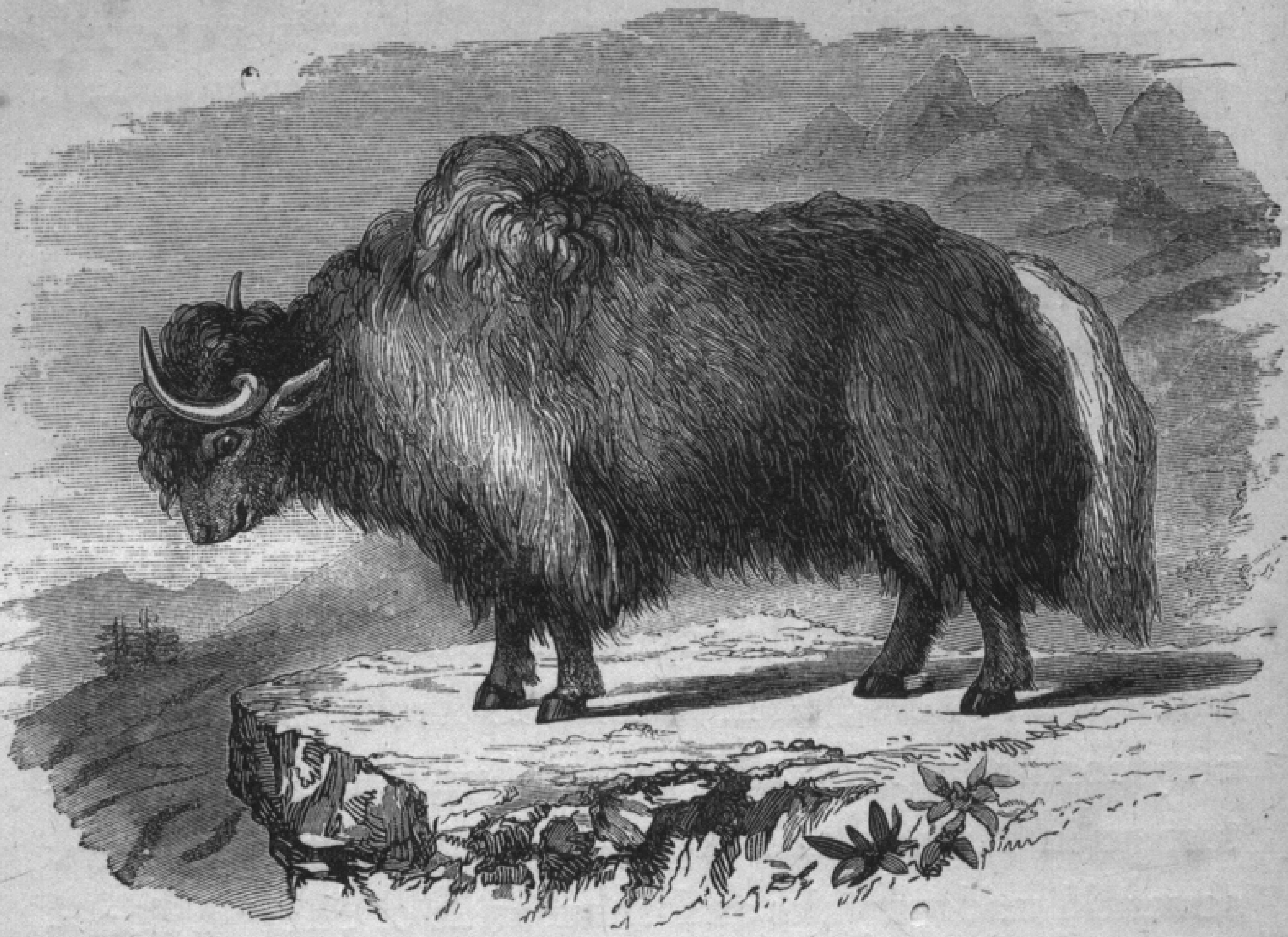
[1] The cloth is woven from yak-wool.

[2] For those readers to whom the term 'White Russia' may not be familiar I may explain that at the present day it applies chiefly to the two Governments of Vitebsk and Mohilev, lying to the south-west of the Russian empire.—M.

But this wretched abode is luxurious compared with the black tent. The former, at all events, is weather-proof, while to the latter summer rains and winter frosts have easy access. There is no exaggeration in saying that the marmot in his burrow is far more comfortable than his neighbour—man. The animal has at least a soft couch to lie upon, but the bed of the Tangutan is a heap of dirt, or sodden pieces of felt, thrown on the damp ground.

The chief occupation of the Tangutans is rearing cattle, which supply all the wants of their simple lives.. Their domestic animals are yaks and sheep (not the fat-tailed kind), with horses and cows in smaller numbers; their wealth in flocks and herds is very considerable, owing to the abundance of rich pasturage in Kan-su and Koko-nor, where we often saw several hundred yaks and thousands of sheep belonging to one owner, whose abode was in no degree better than that of the poorest of his brethren. It is a rare sight to see a rich Tangutan wearing a cotton robe instead of the common cloth dress, or indulging in an extra piece of meat at his meals; his mode of life is, in all respects, the same as that of his servants. He is as dirty as they are; he never washes, and his garments swarm with insects, which he kills without the slightest regard to propriety.

The characteristic animal of the country, and the inseparable companion of the Tangutan, is the long-haired yak, also bred in the mountains of Ala-shan, and kept in large numbers by the Mongols in Northern Khalkas, a hilly, well-watered, and grassy country—indispensable conditions for the well-being of this animal which only thrives at a certain level above the sea. Yaks cannot exist without plenty of water; they are fond of bathing, and are excellent swimmers; we saw them more than once swim across the rapid Tatung-gol, although carrying packs. The domestic yak is of the same size as our cattle; the hair is black or black-and-white; they are very seldom entirely white. Notwithstanding their long domestication, they still retain a good deal of their wild nature; their movements are quick and agile, and when enraged they are very dangerous.[1]



THE YAK (after a Drawing by J. E. Winterbottom, Esq., lent by Dr. Hooker).

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[1] For an account of the domestic yak, see 'The Abode of Snow,' by A. Wilson, chap. xiii. Hooker's 'Himalayan Journals,' i. 212 *seqq.*, and 'Marco Polo,' 2nd ed., i. 268 *seqq.*—M.

The yak not only supplies fine wool, milk, and butter, but is a most useful beast of burden. It certainly requires skill and some patience to fasten the load on his back; but when this difficulty is overcome, he will carry at least two cwt. over lofty precipitous mountains, by the most dangerous paths, climbing ledges of rock where a goat or wild sheep would hardly keep its footing. In the country of the Tangutans, where camels are scarce, the yak is almost the only substitute, and large caravans of these animals are annually sent from Koko-nor to Lhassa.

In Kan-su herds of yaks roam almost at liberty over the pastures, being driven in at night to the tents of their owners. Yak milk is delicious, and as rich as cream; the butter made from it is yellow and far superior to that made from cows' milk. In fact the yak is a most valuable beast, and should be encouraged in Siberia and in those parts of European Russia suitable to its habits, the Ural mountains for instance, or the Caucasus, where it could be acclimatized without great difficulty. Any number of yaks may be purchased at Urga at 5*l.* a head; and they could be driven to Russia at a small expense.

The Tangutans ride the yak, guiding it by means of a rope attached to a large wooden ring inserted in its nostrils. The cross-breed of the yak bull and domestic cow,[1] called by the natives *khainik*, is stronger, more hardy, and therefore more valuable.

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[1] This valuable cross is also mentioned by Marco Polo, in his account of Tangut (2d. ed. i. 266). It is in use also on the Indian side of Tibet.—Y.

We saw some Tangutans near Chobsen, living with Chinese, engaged in agriculture; but a settled life does not harmonise with their restless natures. They pine after the careless pastoral existence best suited to their indolent character.

Their encampments always consist of a few yurtas standing together, very rarely of single tents as is the case so frequently with the Mongols. Indeed, the habits and manners of the two races are quite distinct. The one loves his dry, barren desert, and fears damp more than any hardship; the other, inhabiting a country lying so near, but at the same time physically so different, is quite another stamp of man. He prefers the moist climate and rich soil of his native valleys; he hates and fears the desert. The same remarks apply to their respective animals. The camel of the Mongol is a four-footed counterpart of its master, while the yak typifies the chief peculiarities of the Tangutan.

In the wooded parts of Kan-su, a few Tangutans turn with the lathe different utensils, such as wooden bowls for eating out of, or for keeping butter in; the latter purpose being in general served by yaks or sheep's bladders.

The most common, indeed the only, industry of the Tangutans is preparing yak (or more rarely sheep's) wool for cloth, out of which all their clothes are made. They spin the wool on a long stick with a crook at the end for holding the spindle. The yarn is woven into cloth, not by themselves, but by the Chinese. We may mention that the only measure known to the Tangutans in Kan-su is the span of their arms; so that the measurement of the piece, and therefore the price to be paid for it, depends on the stature of the buyer!

The sole occupation of the Tangutan is tending cattle; this is some break to the absolute idleness to which he gives up his whole life. For hours together grown-up men and women and children sit round the hearth doing literally nothing but drink tea, which is as indispensable to them as it is to the Mongols. In the Tangut country, where, in consequence of the Dungan disturbances, the price of brick tea has considerably risen, dried yellow onion heads are used as a substitute, after undergoing a process somewhat similar to the preparation of tobacco. This 'tea' is chiefly manufactured at Tonkir,[1] and gets its name from that place. The natives drink large quantities of this nasty decoction, mixed with milk. A tea-kettle is simmering all day long on the hearth, and tea-drinking goes on at least ten times a day, guests being always invited to join.

Dzamba (barley-meal) is invariably mixed in the tea; a small quantity being put into a cup half filled with tea, and stirred with the finger, till it thickens into the consistency of paste. To this mess curds are sometimes added by way of a relish, but only by the rich; the poor have to content themselves with tea and dzamba. This disgusting mess is their chief food, but little meat being eaten. Even the rich Tangutan, owner of several thousand head of cattle, will not kill a sheep or yak for his own use, and is so mean and stingy that he will deny himself a piece of meat if by so doing he can save a lan of silver. Tangutans, like Mongols, will eat carrion, and with a relish too. Next to tea and dzamba, their favourite food is *tarik*, i.e. boiled sour skimmed milk, which is to be found in every tent; the wealthier classes also make a kind of cheese of curds and butter, which is considered a great delicacy.

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[1] This town is thirteen miles WNW. of Si-ning. [It is evidently the Tang-keu-eul of Père Huc, which no doubt is the pronunciation of the Chinese characters representing the name.—Y.]

The Tangutans are disgustingly dirty, and never wash the bowls out of which they eat; the cups out of which they drink are merely rinsed out after use, and replaced in the bosom where vermin swarm; they never wash the cow-teats before milking, and they pour the milk into the filthiest of utensils; their churn is a piece of raw sheepskin fastened to the end of a stick, with wool and dirt adhering.

With few exceptions they are no agriculturists, obtaining their supplies of dzamba from Tonkir, a trade centre of some importance. Hither they drive their cattle and carry their skins and wool to barter in exchange for dzamba, tobacco, daba (cotton cloth), Chinese boots, &c., the price of every article being fixed according to the number of sheep it would fetch.

They are as distinct from the Mongols in character as they are in appearance. They are superior to the latter in courage, energy, and intelligence, especially to the Mongols of Koko-nor and Tsaidam.

But they are not so hospitable as the thoroughbred Mongols, and they are very cunning and mercenary, particularly those who mix with the Chinese.

A Tangutan will never do anyone a service for nothing, but will always try to get as much as he can for it, even though it were from his own brother.

Their usual salutation is extending both hands horizontally, with the words *Aka temu*, i.e. 'How do you do?' *Aka*, like the Mongol *nokhor*, signifying *Master*, or *Monsieur*, frequently used in conversation. On making a new acquaintance, and in general on visiting anyone, particularly if he be a person of distinction, a silk scarf[1] is invariably presented, the quality of which depends on the mutual good feeling subsisting between guest and host.

The Tangutans do not admit plurality of wives, but keep concubines. All the domestic work is done by the women, whose rights in the household are, as far as I could judge, equal to those of the men. They have a curious custom of stealing their neighbours' wives, of course not without their secret assent. In such case the stolen wife belongs to her ravisher, who pays the husband a good sum as compensation. They all count their age, not from the day of their birth, but from that of their conception, adding one to the years of their life for that passed in the mother's womb.

They are as zealous Buddhists as the Mongols, and are dreadfully superstitious. Charlatanism and soothsaying are with them mixed up with the doctrines of their faith. The more devout make annual pilgrimages to Lhassa. Lamas are highly venerated, and exercise boundless influence over the people; but temples are not numerous here as in Mongolia, and the Gigens often live in black tents along with ordinary mortals. Their bodies are not buried in the ground after death, but are exposed in the forest, or on the steppe, to be devoured by vultures and wolves.

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[1] This etiquette of the *Khata*, or ceremonial scarf of silk, is expounded at large by Huc (ii. 86), and is mentioned also by Turner.—Y.

The Tangutans are governed by their own officers, who are under the control of the Chinese governor of Kan-su. The latter usually resides at Si-ning, but on the occupation of that town by the rebels, he transferred his seat of government to Djung-ling. On the recapture of Si-ning by the Chinese troops in the autumn of 1872, he returned to his former residence.

The Mahommedan insurrection, which, about ten years ago, spread over all the western dominions of China, and at first appeared to have every chance of success in its struggle with the Manchu government, is now completely on the wane. The insurgents or *Dungans,*[1] as we call them, known to the Chinese under the name of Hwei-Hwei, on the first outbreak of the rebellion, succeeded in attaining liberation from the Chinese yoke, which was their main object, over a vast extent of territory situated to the west of the Great Wall and near the sources of the Yellow River; but they soon gave up acting on the offensive, and confined themselves to brigandage in the neighbouring districts of China and Mongolia. Their last signal successes were the devastation of Ordos and Ala-shan on the east; Uliassutai, Kobdo, and Bulun-tokhoi on the west; soon afterwards they were defeated by the Chinese, and were finally obliged to defend themselves against the decisive measures taken by their opponents to the east of the Upper Hoang-ho. Here we were witnesses of some engagements between the insurgents and Chinese troops. The following narrative will, therefore, refer only to the action of both parties in the province of Kan-su.

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[1] This name is quite unknown to the Mahommedans or Chinese in those districts we visited. The Chinese call all Mahommedans in China by the general name of *Hwei-Hwei.* They are all *Sunnis,* but divided into several sects. [It would appear that Dungans, as used here, is simply the equivalent of Chinese Mahommedans.]—Y.

The Mahommedan insurrection broke out in this province in 1862, and some important successes were at first gained by the insurgents. Three large towns, Si-ning, Tatung, and Suh-chau, fell into their hands; the Chinese garrisons were either put to the sword, or compelled to adopt the Mahommedan religion and enter the ranks of the rebels. Chinese garrisons, however, still held out in some towns situated near those which had freed themselves, and Djung-ling, Sa-yan-chen,[1] Tajing, Lang-chau, and Kan-chau remained in their power, so that Kan-su was not entirely lost to China. The territories held by the respective combatants were not only in contact, but sometimes actually overlapped each other, neither side taking decisive measures to drive the other out.

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[1] Sa-yan-chen is not to be found in Prejevalsky's Map, but we find in Kiepert's 'Asia' (1863), *Sanyantsing*, very near the position of Prejevalsky's Yunan-chen. It is probable, however, that this position is only Kiepert's interpretation of Huc's vague indications, for *San-yen-*

In this position of affairs petty pillaging and brigandage became the primary object of the revolted Mussulmans. And in the absence of nobler motives, these practices speedily led to the decline of their cause, ere it had time to acquire a sound political basis. Instead of advancing in a compact body beyond the Yellow River direct on Peking, and settling beneath its very walls the question of the existence of an independent Mahommedan state in the east of Asia, they dissipated their forces in the movements of small independent bands, chiefly bent on plunder.

Had they acted in a resolute way they might have had a good chance of success. To say nothing of the cowardice and demoralisation of the Chinese forces, the Hwei-Hwei or Mussulmans would have found a powerful support among their co-religionists, who are animated by the bitterest hatred to the Manchu, and would gladly have joined their ranks. If it be remembered that Islamism numbers from 3½ to 4 millions[1] of adherents in China Proper, superior in energy and religious organisation, it can scarcely

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tsin is one of his halting-places (ii. 32), and if so the true place is very doubtful.—Y.

[1] According to an approximate calculation by the Archimandrite Palladius, a distinguished sinologue. See 'Labours of the Peking Mission,' 1866, vol. iv. p. 450.

be doubted that a bold advance of the Dungans might have threatened the tranquillity, nay, perhaps the existence, of the Celestial Empire, and certainly that of the reigning Manchu dynasty. Moreover, provinces of China further south were at the same time disturbed by the revolts of the Taepings and of the Yunnan Mahommedans, though these had no connection with the north-western movement, of which we are speaking. Thus the Peking government was threatened by great calamities both from the south and from the west; but none of her enemies knew how to avail themselves of their first successes, and thus China had time to recover herself, and afterwards, in her turn, to assume the offensive.

Another important element of success was entirely disregarded by the insurgents, and that was to gain the good will of the Mongols, who so bitterly detest the Chinese.

The two races, alien as they are from each other in character and religion, would have found a bond of union in their common struggle for freedom; but from the very first the Dungans ill-used the Mongols, and treated them exactly as they did the Chinese, so that these desirable allies were effectually estranged.

But victory could never have declared for the rebels unless they had acted under one leader. Here they entirely failed. Every large town or district carried on an independent system of warfare under its own chief, whether Akhun or Hadji.[1] The ease with which they plundered Ordos and Ala-shan in 1869, despite the presence of a force of 70,000 Chinese troops on the middle course of the Hoang-ho, is a convincing proof of the success which might have attended their arms in a serious struggle with China. The following year they sacked Uliassutai, and the year after that Kobdo, the chief places in Western Mongolia.[1] Both these towns were garrisoned by Chinese soldiers, who hid themselves at the first appearance of the Dungans, without offering the slightest resistance.

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[1] Thus, in Kan-su, the towns of Si-ning, Tatung and Suh-chau, with their districts, were entirely independent of one another.

We must not, however, draw conclusions from these facts favourable to the valour of the Mahommedans.[2] They are in fact as arrant cowards as the Chinese, and only put on a bold demeanour when they are certain of encountering no resistance. All their plundering forays and skirmishes with the Chinese simply amounted to this;—one set of cowards tries to outwit another; as soon as either side has succeeded, *Væ victis!* woe to the fallen enemy. We were told by eyewitnesses that not satisfied with slaughtering the women, the Mahommedans threw hundreds of little children into deep wells, and then stood gloating over the agonies of their unfortunate victims. The Chinese retaliated in like manner. Whenever victory declared for either side it was immediately followed by a wholesale butchery of the vanquished; no prisoners were made, no quarter given.[1]

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[1] Bulun-tokhoi was destroyed in 1873. The aspect of Kobdo shortly after its capture by the Mahommedans has been described by an eyewitness, Mr. Ney Elias, who visited it in November, 1872. (See *Journal of the Royal Geogr. Soc.*, vol. xliii., p. 134).—M.

[2] I am only alluding to the Mahommedans in Kan-su; those of Chinese Turkestan and the Thian-Shan may be different.

The bands of Dungans who made plundering incursions into Kan-su and on the borders of Mongolia, were composed of every kind of vagabonds, half of whom were often unarmed; the remainder carried spears or swords, and a few matchlocks. Old men and women followed to collect booty, and bring it home under cover of their companions' escort.

To give a correct idea of the absurd nature of the military operations of the Dungans, I will describe the siege of the temple of Chobsen, which happened three years before our arrival in Kan-su, as it was related to us by some of its defenders.

The temple is surrounded by a mud wall, 20 feet high and 280 feet square. In the centre of each face and at the four corners stand small towers, each capable of containing fifteen or twenty men. The wall has a wooden roof, sloping on either side, and at a short distance from it, about 100 houses are scattered about, each standing in its own enclosure. There is no well inside the temple, and water is obtained from a spring in the immediate vicinity.

In the summer of 1868 several thousand Dungans made their appearance at Chobsen, with the object of taking and destroying the temple. Its defenders, numbering 1,000 men, Chinese, Mongols, and Tangutans, retreated within the principal enclosure, leaving the enemy to take possession of the outer houses, which of course they had no difficulty in doing, but the main wall was strong enough to resist all their efforts, and the first assault was unsuccessful. The hour of taking tea now drew near, and as the observance of this custom is not neglected even during actual warfare, the besiegers withdrew to their camp, about two-thirds of a mile from the temple. Taking advantage of such a favourable opportunity, the besieged sallied out of their fortress in full view of the enemy, proceeded to the stream to obtain a supply of water, and in their turn set to work tea-drinking. The next day beheld a repetition of the same process; the Dungans invested till mid-day, when they retired to drink tea; in this way the siege lasted six days, at the expiration of which, finding they could not take the place, the Dungans returned to their homes.

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[1] In every place where the Mahommedans revolted, the Manchu officials and Chinese soldiers were in general exterminated to a man; occasionally soldiers were spared on condition of their embracing Mahommedanism. Of the peaceable Chinese population living in Dungan territory, those who became Mahommedans had equal rights with the conquerors; the others were made slaves. Women were not required to change their religion.

This anecdote would have been almost incredible, had we not convinced ourselves of the rotten state of China and her tributaries. They are all alike, and nothing but ignorance on the part of Europeans could invest them with any of the attributes of power or majesty.

Notwithstanding the rancorous hatred between Mussulmans and Chinese, they are not unwilling to have commercial transactions with one another. In

Kan-su, where the Dungans are in such close proximity with the Chinese, we repeatedly heard it stated that the Mussulmans at such and such a place were on good terms with some temple or village in their neighbourhood with which they traded. Thus the Dungans at Tatung were at enmity with the temple of Chobsen and the surrounding district, while at Simni, on the Tatung-gol, forty miles to the north of Chobsen, they were friendly with the Gigen of its temple, trading peacefully and molesting no one. In the same way the commander of Mur-zasak, one of the banners of Koko-nor, as we have already mentioned, was on excellent terms with the Dungans at Yunan-chen, whom he supplied with cattle.

Such an anomalous position of affairs could only exist in a country like China. Let us now see what measures were taken by the Chinese to quell the insurrection in Kan-su.

After the loss in a few years of the whole of Eastern Turkestan, the countries lying at the foot of the Thian-Shan, and a large part of Kan-su, the Chinese Government began to realise the great danger of their position, and determined to employ every means in their power to prevent the insurrection from spreading to the northern provinces of China Proper. With this view a line of defence was drawn along the upper and middle course of the Hoang-ho. Here 70,000 troops were disposed, partly garrisoning the towns of Kuku-khoto, Bautu, Ding-hu, Ning-hia, Lang-chau, &c., and partly quartered by small detachments in the intermediate villages. The garrisons of those towns of Kan-su which still remained in the power of China were strengthened. Nothing more was done in the first instance. The Dungans, gratified with their success in freeing themselves from Chinese rule, discontinued aggressive measures, and gave themselves up to looting, while the Chinese garrisons immured within mud walls remained tranquil spectators of the complete devastation of the country.

The Chinese troops in Kan-su and on the Hoang-ho were brought from the southern provinces of the empire, and were called by the inhabitants *Khotens*; they also included a few Solones from Manchuria. Their arms consisted of swords, matchlocks, a few smooth-bore English muskets and double-barrelled pistols, some of English and others of Tula manufacture, the latter probably obtained on the Amur. The cavalry and some of the infantry were armed with long bamboo lances, decorated with red flags and effigies of the dragon.

The moral qualities of Chinese soldiers are so peculiar that a European would find difficulty in believing it possible for an army composed of such elements to exist, particularly when brought into the field. In the first place all of them, officers and men, are addicted to opium-smoking, and cannot exist without it for a single day. This vile habit is not only practised in barracks, but even on a campaign, in the face of an enemy, they will smoke themselves into a state of torpor. The result is moral and physical debility, and complete unfitness for the hardships and privations of warfare. Their discipline is so bad that they are incapable of keeping on the alert even for a few days, and they would fall an easy prey to an active energetic enemy. They post no picquets; they make no reconnaissances. Any information of the enemy's movements is reported by spies; so unfitted are they for physical exertion that nothing but the threat of instant execution will compel them to leave the shelter of their house or tent in bad weather, or at night. On the march the infantry either ride or travel in carts; nothing will induce them to go on foot, even for a few marches. Finding their arms inconvenient to carry, they frequently lay them on the cart or camel in order to feel quite at their ease, as if they were on a pleasure excursion.

On arriving at the night halting place they loot and rob the inhabitants of everything they possess. One carries off a hen, another a sucking-pig, a third a bag of flour, a fourth forage for his horse; in fact, their system of foraging reminds one of an enemy's town given up to pillage. Officers take an active part, only that, instead of robbing on their own account, they take the plunder from the men; no complaints are heard or even made, and the inhabitants are only too glad if they can keep a whole skin. So customary is this style of thing that the Mongols, directly they hear of the approach of the Chinese troops, remove their encampments to great distances from the road, or hide in the mountain defiles with their herds;[1] and caravans take circuitous routes in order to avoid meeting the soldiers.

Garrison troops also commit the same depredations. After first pillaging the country in the immediate vicinity of the town in which they are quartered, they proceed in small detachments on more distant forays which sometimes last for several days. The commander receives his share of the booty, and everything is arranged satisfactorily. Officers of all ranks, from the highest to the lowest, rob the government as much as they can. The chief source of their illicit earnings is derived from the pay of soldiers who have died or deserted, which they continue to receive long after it has ceased to be due. Desertion is so common that many of the battalions are reduced from 1,000 to 100 men, and it has been confidently asserted that the 70,000 troops on the Hoang-ho actually do not number more than 30,000. All these facts are of course concealed from the government at Peking.

The severest penalties will not check these offences, or restore the *morale* of the army. The ordinary punishment for light offences is the bastinado, applied on the soles of the feet with bamboo sticks, but desertion, insubordination, and in some cases plundering, are punishable by death. But where crime is so widespread, it seems rather to be aggravated than diminished by severity, and year by year the Chinese soldiers become more demoralised. But the picture we have drawn of the defenders of the Celestial Empire is still incomplete. The most striking trait in their character is cowardice, innate in all Chinese, and not considered a disgrace; far from this, the discretion of the soldier who runs away is sometimes highly praised.[1] The tactics of warfare consist in frightening the enemy, never in hazarding a resolute attack. The order of battle is a semicircle threatening the front and flanks simultaneously; the troops open fire at a distance ten times further than the range of their guns, utter fearful cries after every round, and altogether behave in a childish way, which of course would produce no effect on superior troops. A bold well-armed enemy might march into any part of the Middle Kingdom with perfect confidence of the result. He need not trouble himself about the number of his opponents; one wolf will put to flight a thousand sheep, and every European soldier is a wolf in comparison with Chinese soldiers.

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[1] So says Marco Polo, of the people near the western parts of the Gobi: 'When an army passes through the land, the people escape, with their wives, children, and cattle, a distance of two or three days' journey into the sandy waste; and knowing the spots where water is to be had they are able to live there, and to keep their cattle alive, whilst it is impossible to discover them; for the wind immediately blows the sand over their track.'—Book I. ch. 38.—Y.

This was the state of affairs in Kan-su for ten years. The Chinese garrisoned those towns which remained faithful to them, while the insurgents ravaged the country, neither of the belligerents taking more decided measures. The governor of Kan-su resided at Djung-ling, while a Dungan akhun ruled at Si-ning.[1]

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[1] It is hardly necessary to comment on this wild kind of talk. The army of Colonel Gordon showed of what Chinese soldiers are capable when rationally disciplined and boldly led.—Y.

At length the authorities at Peking determined to resort to more energetic measures, and accordingly despatched a new army of 25,000 men to the scene of action. Their chief object was to capture Si-ning, an important commercial city with a large population. Advancing in échelons, the Chinese troops only arrived in Kan-su by the month of June 1872, and quartered themselves in the towns of Nim-pi and Ou-yam-pu, about thirty miles from Si-ning. Here they passed two months in complete idleness, merely pillaging the neighbouring country, and giving the Mahommedans time to assemble 70,000 men in Si-ning. Not till September did they advance against this town, and take up their position beneath its walls, within which the defenders had as usual retired. Four European field-pieces, brought from Peking, struck terror into the insurgents. Each of these guns was drawn by six mules caparisoned in silk, and none durst approach them under fear of immediate death. They were furnished with grape shot and small shells, which were of the greatest service to the Chinese.

At the assault of the town, some of these shells burst in the streets, and created a panic among the defenders. To make matters worse, one of them which had not exploded on falling suddenly burst among the crowd, killing and wounding several, and putting the rest to flight. The fight, however, continued for a few days after this occurrence, until the Chinese captured a part of the wall, and obliged the defenders to retreat to another part of the fortifications.

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[1] It is said that the loss of Si-ning was not reported at Peking until three years afterwards.

At this juncture, news was received of the marriage of the Emperor of China. Siege operations were immediately suspended, and a theatre was built by the soldiers to celebrate the auspicious event. The rejoicings, fireworks, and theatrical representations were continued for a week, during which time most of the officers and soldiers were drunk, or insensible from opium-smoking; and this went on close to a still unconquered enemy. If the Dungans had only had 100 men of any pluck among them, they could, in one night attack, have slain 1,000 Chinese soldiers, and dispersed the remainder. But not even a handful of brave men were to be found among the cowardly defenders of Si-ning. They knew very well that as soon as the Chinese had once taken possession of the town, they would receive no grace, but yet they could not muster up courage enough to profit by a singularly favourable opportunity which thus presented itself.

This is an instance of the moral degradation of the East, where a man cannot overcome his animal instinct of self-preservation, and invariably shows signs of cowardice when left to himself; but when once the coward is in a position out of which he cannot extricate himself, he becomes completely indifferent to death, and walks to the scaffold like an animal without reason.

Having celebrated the marriage of the Emperor, the Chinese troops recommenced military operations and soon took Si-ning. Then commenced a wholesale butchery of the vanquished. We were told by eye-witnesses that the Chinese soldiers, wearied with slaying the people with cold steel, collected them into bands, without distinction of age or sex, and drove them to the mountains, where they pitched them down precipices; in this way 10,000 were put to death.

After the capture of Si-ning, its Chinese governor was reinstated, and in the course of the winter three more towns were re-captured: Seng-kwan, Yunan-chen, and Tatung. Here they only spared those of the rebels who would abjure Mahommedanism and embrace Buddhism. Numbers of Dungans fled to join their co-religionists in the west.

After receiving further reinforcements from Peking, the Chinese continued their advance westwards, and in the summer of 1873 captured the important rebel position of Suh-chau.[1] No authentic news of the recent operations of the Chinese has been received. They have now, at all events, a more difficult task before them, in their struggle with Yakub Beg of Kashgar.

Here is the list of Tangut words which I made:

Mountain . .	Ri-i[2]	River	Chsiúchen(g)
Range . . .	Khika	Rivulet . . .	Siúbchen(g)

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[1] It is reported that all the inhabitants of Suh-chau were massacred.

[2] Prolonged vowels are denoted by doubling them.

Lake	Tso-o
Water	Chsiu
Grass	Rtsa
Forest	Shan(g)
Tree	Shan(g)-Kirch
Firewood	Mi-i-shan(g)
Fire	Mi-i
Cloud	Rmúkha-a
Rain	Tsiar
Snow	Kin
Thunder	Onám
Lightning	Tok
Frost	Khabsá
Heat	Tsátchigeh
Wind	Lun(g)
Road	Lam
Tea	Tsia-a
Yurta (tent)	Kirr
Hearth	Khtsiaktáb
Tent	Riukárr
Milk	G(h)óma
Butter	Marr
Meat	Sha-a
Sheep	Liuk
Goat	Ramá
Cow	Sok
Bull	Ólunmu
Yak { male	Yak
female	Ndjeh
Dog	Tscho
Horse	Rta-a
Ass	Onléh-eh
Mule	Pchi-i
Bear	Bsiugdjét
Beaver	Chiúkram
Wolf	Káadam
Fox	Gaa
Steppe fox	Beh-eh
Hedge-hog	Rgan
Bat	Pána-a
Jerboa	Rkhtílu
Hare	Rúgun
Lagomys	Bchjaa-Djákzium
Mouse	Kharda
Marmot	Sho-o
Dzeren (antelope)	Go-o

Wild-boar	La-a
Chamois	Kashá
Deer { buck	Sha-a?
doe	Imú
Argali	Rkhian(g)
Kuku-yaman	Rna-a
Camel	Namún(g)
Felt	Dziugón
Fur cloak	Rtsókha
Hat	Sia-ia
Saddle	Rtárga
Dressing-gown	Lo-o
Boots	Kham
Shirt	Tsélin(g)
Pipe	Tétkhu-u
Tinder	Mítsia
Tobacco	Dó-oa
Horse-shoe	Rníkhtsiak
Tobacco-pouch	Diudkhúk
Man	Kcheibsa
Woman	Yerkmát
Child	Siázi
Husband	Veh-eh
Wife	Rgánmu
Man in the sense of human being	Mni
Head	Mní-gou
Eye	Nik
Nose	Khna-a
Forehead	Tombá
Ears	Rna
Eyebrows	Dzúma
Mouth	Ka
Lips	Chéhli
Cheeks	Dziámba
Face	No-o
Hair	Khtsia
Moustachios	Kóbsi
Whiskers	Dziára
Beard	Dziámki
Teeth	So-o
Tongue	Khtseh
Heart	Rkhin(g)
Blood	Chak
Neck	Khnia
Intestines	Dziunák

Breast	Pchan
Hands	Lókhva
Fingers	Mdzugéheh
Nails	Tsínmu
Back	Tsánra
Stomach	Chómbu
Feet	Kúna-a
Footstep	Kánti
Knee	Ormú
Hungry	Khtsínar
God	Skha-a
Angel	Túnba
Devil	Djeh-eh
Paradise	Lámrton-lamá
Hell	Ouardú
Sky	Nam
Sun	Níma
Stars	Kárama
Moon	Dáva
Earth	Sáazyu-u
Year	Námrtsa-a
Week	Níma ?-abdún
Day	Nima ?
Night	Namgum
To walk	Djeyo
To stand	Laniót
To eat	Tása
To drink	Tún
To sleep	Rnit
To lie	Niaya
To sit	Dok
To cry	Kiúpset
To speak	Shóda
To pray	Shágamtsa
To see	Khtsírkta
To bring	Tséhrashok
To go	Dándjeh
To run	Dardjúk
He	Kan
Is	Yut
Yes	Rit

No	Mit.
1	Khtsik
2	Ni
3	Sum
4	Bjeh
5	Rna
6	Chok
7	Diun
8	Dziat
9	Rgiu
10	Tsiú-tambá
11	Tsiú-khtsik
12	Tsiú-ni
20	Ni-chi-tambá
30	Sum-chi-tambá
40	Bjéh-chi-tambá
60	Chok-chi-tambá
70	Diún-chi-tambá
80	Dziát-chi-tambá
90	Rgiup-chi-tambá
100	Rdziá-tambá
101	Rdziá-ta-khtsík
102	Rdzia-ta-ní
200	Ní-rdzia
300	Súm-rdzia
400	Bjéh-rdzia
500	Rná-rdzia
600	Chók-rdzia
700	Diún-rdzia
800	Dziát-rdzia
900	Rgiú-rdzia
1,000	Rtún-tik-khtsík
2,000	Rtún-tik-ní
10,000	Chí-tsok-khtsik
20,000	Chí-tsok-ni
100,000	Búma
200,000	Búma-ni
300,000	Búma-sum
1,000,000	Síva
10,000,000	Dúnkhir.[1]

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[1] Some remarks on this 'Tangutan' vocabulary will be found in

CHAPTER V.

KOKO-NOR AND TSAIDAM.

The lake—Colour of its waters—Island and temple—Fish—Legendary origin of lake—Its shores—Birds—Animals—The Kulan or wild ass—Eleuth Mongols—Low standard of civilisation—Kara-Tangutans—Their predatory habits—Mongol tradition concerning them—Administrative divisions of Koko-nor—We buy fresh camels—Tibetan envoy—Favourable opportunity of reaching Lhassa lost—We determine to advance—Guides—Temple of Kumbum and its sacred tree—Tibetan medicine—Route along shore of lake—Ponhain-gol—Huc's account of river inaccurate—Southern Koko-nor range—Djaratai-dabas salt basin—Princess of Koko-nor—The Tsing-hai-wang—Our reception—My reputation as saint, prophet, and physician—*Baumsteitismus*, a universal panacea—Mongol ailments—Plain of Tsaidam—The Baian-gol—Saline vegetation—Karmyk berries—Scarcity of animal life—Inhabitants—Lake Lob—Wild camels and wild horses—Autumn on Koko-nor—Clear atmosphere—Cultivated land—Crossing the marshes—Tsung-zasak—Mongol guide 'Chutun dzamba.'

LAKE KOKO-NOR, called Tsok-gumbum by the Tangutans, and Tsing-hai[1] by the Chinese, lies to the west of Si-ning, at a height of 10,500 feet above the level of the sea. In shape it is an ellipse with its longer axis running from east to west. It is from

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[1] The Mongolian name signifies 'light blue'—the Chinese 'dark blue.' We could not ascertain the exact meaning of the Tangutan name. The inhabitants of the region, and in general the Southern Mongols, call it Khoko-nor, i.e. softening the *k* into *kh*.

[The Tangutan, *i.e.* the Tibetan name of the lake is properly *Tso-ngonbo*, as written by Della Penna, or *Tsot-Ngon-po*, as written by Huc, meaning just the same as the Mongol and Chinese, viz., 'Blue Lake.'—Y.]

200 to 230 miles in circumference; we could not, indeed, ascertain its exact size, but the natives told us that it took a fortnight to go round it on foot, and seven or eight days on horseback. Its shores are very flat and shelving; its water salt and undrinkable. But this saltness imparts an exquisite dark blue colour to the surface, which excites even the admiration of the Mongols, who have compared it not inaptly to blue silk. It is certainly very beautiful, especially as we first saw it, late in autumn, when the snowclad mountains formed a white frame for the velvety blue waters which passed out of sight on the eastern horizon.

Many streams flow into Koko-nor, the more considerable being eight in number, of which the Pou-hain-gol, joining its south-western corner, is the principal.

As on other great lakes even a light breeze will often raise its waves,[1] and it is rarely and only for short intervals calm. Strong winds prevail about the middle of November, when the lake freezes and remains ice-bound till the end of March, i.e. for 4½ months.

In the western part of the lake, some fourteen miles from the southern shore, there is a rocky island[2] about six or seven miles in compass, on which stands a small temple inhabited by ten lamas, who have no means of communication with the main land during summer, for there is no boat on the lake, and none of the inhabitants understand the use of one. In winter pilgrims cross over the ice, and bring presents of butter and barley-meal to the hermits, who at this season come out of their cells to collect alms.

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[1] Huc asserts that there is a perceptible ebb and flow in this lake. I purposely stuck poles into it and convinced myself that there was no regular rise and fall of the water. The descriptions of Huc, from Lake Koko-nor forwards, are in general curiously inaccurate, as we shall have more than once to remark. See *Souvenirs d'un Voyage*, &c., vol. ii. p. 185.

[2] The inhabitants of the shores of Koko-nor say there is only one island.

Koko-nor abounds in fish, but you find only a score or two of Mongol fishermen on its shores, and these send all that they catch to the town of Tonkir. Their nets are small, and the fishing is chiefly carried on at the mouths of the streams which flow into the lake. The only kind of fish that we saw was the *Schizopygopsis* nov. sp., which we captured ourselves; we heard that though there were many other species, owing to the badness of the nets they were rarely caught.

The local tradition[1] of the origin of Koko-nor represents it to have once been an underground lake in Tibet, in the place where Lhassa now stands, and to have been transferred to its present site before the memory of man. The story runs thus:—

In olden days, before the present residence of the Dalai-Lama was built, one of the sovereigns of Tibet bethought him of erecting a splendid shrine in honour of Buddha, and so having selected a site he began to build. Thousands of workmen were employed for a whole year, but no sooner was the edifice completed than the whole suddenly tumbled to pieces. Again the work was begun, and again, from some unknown cause, it fell to ruins. It was rebuilt a third time, but the result was just the same. The king, startled and alarmed, applied to one of the gigens to explain this phenomenon. Though the prophet could give no satisfactory answer, he was able to inform his master that in the far East there lived a saint who alone of mortals possessed the secret, and that if the king could extort it from him the building might be completed. On receiving this answer, the monarch chose a trusty lama and sent him in search of the saint.

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[1] This legend is related by Huc (*Souvenirs d'un Voyage*, &c., vol. ii. p. 189–194). The only new point that I have been able to add is the story of the origin of the island.

In the course of some years the envoy travelled through nearly all the Buddhist countries, visiting the most famous shrines and conversing with the different gigens without finding anybody answering to the prophet's description. At length, disgusted with the ill-success of his mission, he determined to return home by those great steppes which stretch on the borders of China and Tibet. One day as he was riding over the plain, the buckle of his saddle-girth broke, and seeing a solitary little *yurta* (tent) not far off, he went towards it for help. On entering he found a blind old man engaged in prayer, who welcomed his guest, and gave him a buckle from his own saddle. He then invited the traveller to sit down and drink tea, and enquired of him whence he had come and whither he was going. Unwilling to disthat he was a native of the West, and had come on a pilgrimage to pray at all the famous temples of the East. 'Ah!' said the old man, 'we are fortunate indeed in possessing so many beautiful shrines. They are trying in vain to build one in Tibet, but their work will never be completed, because in the very place which they have chosen for it, there is a subterranean lake which loosens the foundations as fast as they are laid. But, prithee, keep this secret, for if the Tibetan lamas hear of it, the waters of the lake will pass hitherwards and swallow us up.'

Hardly had he done speaking when his guest started from his seat, and announcing that he was a lama from Tibet whose object was to discover this very secret, jumped on his horse and galloped away. Despair and fear took possession of the old man. He began calling loudly for help, and as soon as one of his sons, who was tending the cattle hard by, came in, the father bade him quickly saddle a horse. 'Haste thee, haste thee after that lama, and wrest his tongue from him.' Of course the old man was thinking of his secret, and meant that the son should put the stranger past blabbing. But the word '*kileh*' means in Mongol either the tongue of a man or animal, or the buckle of a saddle-girth. Hence, when the messenger overtook the lama he told him that his father wanted him to return his '*kileh*,' whereupon the latter unfastened the borrowed buckle and gave it to the son, who returned with it to his father. The latter on finding that his son had only brought back the buckle, and had suffered the lama to continue his journey, exclaimed, 'God's will be done! All is over! We are lost!' Sure enough that night a fearful subterranean noise was heard; the earth opened; and streams of water pouring forth from below soon flooded the wide plain. Much cattle and many souls perished, the old man among the rest. At length God took pity on sinful mortals and sent a wonderful bird, which flew away with a huge rock from the Nan-shan mountains, and deposited it in the fissure whence the waters were pouring forth. The flood was now stopped; but the plain had been already converted into a lake, and the safety-bringing rock became the island which you see to this day.

The lake is closely hemmed in by mountains on its northern and southern shores, while on the east and west the mountains are at some distance. The narrow strip of level ground between the lake and the mountains is excellent steppe-land, resembling the best parts of the Gobi, only more plentifully watered. The contrast between the climate, flora, and fauna here and those of Kan-su is very remarkable. Instead of the unceasing rain, snow, and moisture which we had lately experienced, we now had fine autumnal weather which continued every day. But instead of alpine meadows, forests, and a damp loamy soil, we were now in the midst of plains of saline clay, covered with steppe-grass and tall *dirisun*, where those ever-recurring denizens of the steppe, the *dzeren* and *ogotono* (alpine hare), larks, and sand-grouse were to be seen. Here too were new kinds of birds and mammalia, peculiar to the deserts of Tibet.

The most remarkable of the birds was a species of lark (*Melanocorypha maxima*) larger than a starling; inhabiting the tufted marshy grass, an exquisite songster. Two kinds of *Montifringilla* (*M. ruficollis* and another) and a *Podoces humilis* were occupying the burrows of the alpine hare. The Mongol sand-grouse (*Syrrhaptes paradoxus*) is a rarer bird in these steppes than its allied Tibetan species (*Syrrhaptes Tibetanus*), which is larger and has a different note. The waders (*Grallatores*) had left before our arrival, and of the web-footed tribe only a few geese (*Anser cinereus*), ducks (*Anas boschas, A. rutila, A. crecca, Fuligula cristata*), cormorants (*Phalacrocorax carbo*), and gulls (*Larus Ichthyætus, L. ridibundus*) remained. We thought that the autumnal migration must have passed, but our observations in the following spring proved that Lake Koko-nor did not abound in waterfowl or wading birds. Among birds of prey, vultures and lammergeiers daily visit its shores in search of food, and numerous buzzards, hawks, and eagles appear to winter here for the sake of feeding on the alpine hares that are found so abundantly.

The last-named animal, differing very slightly in appearance, size, and voice from its Mongol congener, inhabits in extraordinary numbers the pasture land at the foot of the mountains; honeycombing the ground for miles, so that it is dangerous to ride over it at a trot. Hundreds and thousands may be seen on a fine day disporting themselves in the open, or basking in the sun near their holes; and although destroyed by eagles, buzzards, and hawks, wolves, foxes, and steppe-foxes, they multiply so quickly as to make up for all losses.

The most remarkable animal of the steppes of Koko-nor is the wild ass or *kulan*,[1] called *djang* by the Tangutans (*Equus Kiang*), in size and external appearance closely resembling the mule; the colour of the hair on the upper part of the body is light chestnut, and white underneath. We saw them first on the upper Tatung-gol, where the Kan-su mountains are unwooded, and the pasturage is good. The kulan ranges over Koko-nor, Tsaidam, and Northern Tibet, but it is found in the greatest numbers in the first-named country.

The steppes, however, are not its exclusive habitat; it is also found in the mountains wherever grass and water are abundant. We occasionally saw it on the lofty mountains of Northern Tibet, grazing with the *kuku-yamans*. The kulans mostly keep in troops of ten to fifty; larger herds of several hundred being only met with in the vicinity of Koko-nor; and it is not probable that they often congregate in such large numbers, for when seen by us they invariably broke up into smaller troops, and dispersed in different directions.

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[1] A woodcut of this animal, after Wolf, will be found in Yule's 'Marco Polo,' 2nd ed., vol. i. p. 227. It was described by Pallas and Moorcroft. See also Hooker's 'Himalayan Journals,' vol. ii. p. 172.—M. Some naturalists have distinguished the *Kiang*, Pallas's *Dshiggetai*, from the *Kulan* of Western Turkestan, the *Ghorkhar* of Persia. The late Mr. Blyth (*Jour. As. Soc.* Bengal, vol. xxviii.) says they differ only in shades of colour and unimportant markings.—Y.

Each lot of mares is led by a stallion, the size of whose family depends on his age, strength, and courage; his individual qualities keeping his harem together. Old and experienced stallions have as many as fifty wives, whilst the younger are obliged to content themselves with five or ten. Young or unfortunate bachelors roam about alone, casting envious glances from a distance at their older or happier rivals, by whom again they are always regarded with suspicion, and never allowed to approach the harems. Should one of these stallions notice another approaching too near his troop, he rushes to the encounter and tries in every way by kicking and biting to drive him off. Fights frequently occur during the rutting season, which we were told by the Mongols is the month of September. The males are very jealous and combative at this season, and sometimes go out of their way to seek an antagonist. The young are born in May; but often die before attaining maturity; and in the largest herds we saw but a few foals, which never seemed to leave their mother's side.

The kulan's sight and hearing are excellent. It is difficult to kill him on level ground. The best way is to walk boldly up to the troop, which you may do to within 500, or sometimes, though rarely, 400 paces, but even at this distance you cannot be certain of your aim, and should you not hit him in a vital part he will not fall. It is useless attempting to stalk them on level ground as it makes them more wary and shy. You may perhaps succeed in getting within 200 paces of a herd, but you must still be careful to aim at the head, or behind the shoulder; a kulan with a broken leg will run for some distance before he lies down in a hollow or ravine. The best time to stalk them is when they are drinking; this is the plan usually adopted by the natives, who kill them for the sake of their meat, which is esteemed a great delicacy, especially in autumn, when they are very fat.[1]

When alarmed a kulan runs down wind with his great ugly head and scanty tail stretched out. In their flight they always follow their leader, generally in single file. After running a few hundred yards, they will stop, huddle together and confront the object of their fears for a few minutes; the stallion will then advance and try to reconnoitre the source of danger. If the hunter still continue to approach them, they will again take to flight, but this time they will run a good deal farther. The animal is not nearly so wary as you would at first sight suppose it to be. I only heard its voice twice—the first time when the stallion was driving back to his troop some strayed mares, and the second when two males were fighting. The noise they made was a loud harsh neigh, repeated at short intervals, and combined with a bray.

The inhabitants of Koko-nor and the conterminous country of Tsaidam are Mongols and Kara-Tangutans. The Mongols are chiefly Oliuths (Eleuths), with some Turguts, Khalkas, and Koites. Exposed to the implacable hatred of the Tangutans, the Mongols of Koko-nor are the worst of their race. In face they are not unlike the Tangutans, but their expression is stupid, their eyes dull and heavy, and their disposition morose and melancholy. They show no energy, no strong desire for anything, but a sort of brute apathy as to everything in the world except food. The prince (*Wang*) of Koko-nor, a man of some intelligence, spoke of his subjects to us as only externally resembling human beings; as in all other respects absolutely beasts. 'Knock out a few of their upper front teeth, set them on four legs, and you have regular cows,' added he. The Mongols of Koko-nor have adopted even the mode of life of the Tangutans, and live in black tents; towards Tsaidam, however, further from Koko-nor, the felt *yurta* re-appears. The Kara-Tangutans outnumber the Mongols in Koko-nor, but their chief habitations are near the sources of the Yellow River where they are called Salirs;[1] they profess the Mahommedan religion, and have rebelled against China. The Kara-Tangutans are only nominally subject to the Chinese governor of Kan-su; they regard the Dalai-Lama of Tibet as their lawful sovereign, and are under their own officers, refusing to submit to the chiefs of the Mongol banners in whose districts they are living.

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[1] The ghorkhar, or wild ass of the Persian Desert, is also highly prized for his flesh.—Y.

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[1] *Salirs* or *Salars*. The archimandrite Palladius observes that they are so named after their place of habitation. They are also called the 'black-yurta Fans,' 'dog-Fans,' and 'Mahommedan Tangutans.' Suen-hwa quotes a legend in which this people are described as a colony of Uigurs. They are noted for their fanaticism, and appear to be the backbone of the Dungan insurrection. They inhabit the department of Ho-chau, near the borders of the Koko-nor district. 'Trans. of the Imperial Russian Geographical Society,' vol. ix. 305.—M. [According to a Russian work quoted in 'Marco Polo,' 2nd ed. ii. 23, *Salar* is the name by which Ho-chau is known to the Mahommedans of Central Asia. See 2nd ed. ii.—Y.]

The Kara-Tangutans of Koko-nor live by rapine and plunder, and the Mongols of the province are their habitual prey. Not only are the cattle driven off, but the people are mercilessly put to death or carried off into captivity. The Mongols, besides being arrant cowards, are powerless to defend themselves against their better-armed enemies, and if by chance in self-defence a Mongol happen to kill a Tangutan robber, he must pay the family of the slain man a heavy fine or, in the event of his being too poor to pay, the whole koshung or banner to which he belongs is mulcted on his account. If payment be refused, the Tangutans assemble a force of several hundred men and make war. As their marauding expeditions are unpunished, the numbers of the Mongols diminish year by year, and, unless the Chinese Government take decisive measures to protect them, they will be exterminated before long. Not content with plundering the immediate neighbourhood, the Tangutans extend their raids to some distance, as, for instance, to Western Tsaidam. For these expeditions they organise small bands of ten men, each of whom leads a spare horse or two in case the one he is riding should die on the road.[1]

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[1] To lead spare horses with them on their expeditions of plunder

Provisions for two or three months are taken on pack-camels. Returning home laden with spoil, the first act of the robbers is to implore God's forgiveness, and the more easily to obtain it they ride off to the lake, where they buy, or perhaps appropriate without payment, a quantity of newly-caught fish, and throw these back into the waters.

According to the Mongols the Kara-Tangutans began to plunder this country and Tsaidam about eighty years ago, and since that time have continued uninterruptedly this mode of gaining a livelihood. The Chinese governors of Kan-su are bribed by the robbers to give a certain degree of countenance to their proceedings, so that the complaints of the Mongols are never listened to. A local Mongol tradition on the origin of the Kara-Tangutans and Mongol-Oliuths of Koko-nor runs as follows:—

Several hundred years ago a people of Tangutan race lived on the shores of Koko-nor, called Yegurs,[1] who professed Buddhism, and belonged to the red-capped sect.[2] These Yegurs were continually plundering the caravans of pilgrims on their way

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and invasion was a regular practice of the mediæval Tartars. See 'Marco Polo,' 2nd ed. i. 256.—Y.

[1] These might be the Uigurs, were not they of Tangutan, not Mongolian race. [I do not clearly understand this note. The *Uigurs* are generally understood to be typical *Turks*, and in great measure the progenitors of the present people of the Kashgar basin. But it is possible that the existence of these *Yegurs* in Tangut may have to do with the thesis so obstinately maintained by I. J. Schmidt that the *Uigurs* were Tibetans.—Y.]

[2] Buddhists in Tibet are divided into two sects, the red-capped and yellow-capped. The radical difference between them is that while the former allow their lamas to

from Mongolia to Tibet, until the Oliuth prince Gushi-Khan, who ruled in North-western Mongolia, marched an army to Koko-nor to subdue them. The Yegurs were partly exterminated, but some of them escaped to North-western Kan-su, where they mixed with the other inhabitants.

After the subjection of the Yegurs, some of the Oliuth (Eleuth) troops returned to the north, but others settled in Koko-nor; their descendants are the Mongol inhabitants of the present day. Some hundreds of them emigrated to Tibet, where their posterity has multiplied and now numbers 800 yurtas divided into eight koshungs (banners). They live six days' journey to the south-west of the village of Napchu,[1] where they cultivate the soil and bear the name of Damsuk-Mongols, after the little river on whose banks they are settled.

The tradition further says that when the Yegurs were destroyed by the Mongols, one old woman, with three daughters all in the family way, escaped to the right bank of the Hoang-ho. Here the daughters gave birth to three sons, from whom are descended the Kara-Tangutans, or, as they call themselves, the *Banik-Koksum*. During the course of many years they increased in numbers and returned to Koko-nor, where they were at first obliged to defend themselves against the Mongols, but as they became more powerful, in their turn took to plundering.

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[1] The village of Napchu is near the southern foot of the Tang-la, twelve days' march from Lhassa, on the high road taken by pilgrims from the north. [Huc mentions this village and its Mongol inhabitants,

'Had we but slain those three accursed girls,' remarked the Mongols, 'there would be no Kara-Tangutans now, and we should live in peace.' According to their reckoning eight generations have elapsed since the Oliuths came to this country.

For administrative purposes the district of Koko-nor includes a vast region besides the basin of the lake: viz. the upper Tatung-gol on the north, and the whole country to the borders of Tibet on the south; or in other words, the region comprising the sources and head waters of the Hoang-ho and Tsaidam, extending a long way to the north-west. The whole of this is divided into twenty-nine koshungs (banners), five of which lie on the right, i.e. western bank of the Upper Hoang-ho, five in Tsaidam, whilst the remaining nineteen are situated in the basin of the lake and on the upper Tatung-gol. With the exception of the five koshungs on the right bank of the Upper Hoang-ho, under the immediate control of the amban (governor) of Si-ning,[1] all the administrative divisions are under two Tsiun-wangs, Tsing-hai-wang and Mur-wang, each having twelve koshungs under his supervision; the former governing the western or larger, the latter the eastern part of the country.

Our camels were quite done up and unfit for further use when we left Kan-su. Fortunately camels were plentiful here, and we had no difficulty in exchanging our tired-out beasts for fresh ones, by making an additional payment of ten to twelve lans a-piece (2*l.* 15*s.* to 3*l.* 6*s.*). We had now again eleven camels, but our money was reduced to 100 lans (27*l.* 10*s.*). How could we expect with such a pittance as that to get to Lhassa, however great our good luck otherwise? Shortly after our arrival at Koko-nor a Tibetan envoy paid us a visit; he had been sent in 1862 by the Dalai-Lama with presents for the Emperor, but arriving here at the time of the outbreak of the Dungan insurrection in Kan-su and the occupation of Si-ning by the rebels, he was detained, and ever since then had lived here or at Tonkir without being able to continue his journey to Peking, whilst he did not dare to venture back to Lhassa. Hearing that four Russians had passed through the very country which he was afraid of entering when backed by an escort of several hundred men, he came to see what manner of men we could be.

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[1] According to the Mongols the inhabitants of these koshungs are almost exclusively Tangutans

This envoy, whose name was Kambi-nansu, was a most obliging, amiable man, and offered us his services at Lhassa. He told us that the Dalai-Lama would be very glad to receive Russians, and that we would be well received. We listened to this with heavy hearts, for we saw clearly that now nothing but want of money prevented us from penetrating to the very heart of Tibet! When will any future traveller have so good a chance as we were thus compelled to forego? How much will have to be spent another time to attain an object which a small expenditure would now have placed within our grasp? A sum of 1,000 lans (275*l*) would have sufficed to take us from Koko-nor to Lhassa and thence to Lob-nor, or whither we would.

Although thus obliged to give up all hopes of extending our travels to the capital of Tibet, we determined nevertheless to advance as far as possible, well aware how important to science is every additional footstep in these unknown regions of Asia.

We obtained two guides as before from the Mongol and Tangutan military officials, partly in return for presents, and partly in consequence of the letter of the treasurer of Chobsen to Mur-zasak and of our Peking passport, which specified that two subjects of the Celestial Empire were constantly to be in our service. This paragragh indeed was inserted to provide for the event of our hiring Mongols or Chinese servants, but we were advised to take advantage of it to obtain guides, as we succeeded in doing, to Koko-nor and Tsaidam.

One of the guides whom we hired at Koko-nor had formerly been an officiating lama at the temple of Kumbum, twenty miles south of Si-ning, famed throughout Lamadom as the birthplace of the Buddhist reformer Tsong-kaba, whose sanctity, the Buddhists say, was proved by different miracles. Thus a tree grew up from the place where his swaddling clothes were buried,[1] bearing leaves marked with the Tibetan alphabet; this may still be seen at Kumbum, where it stands in a separate court, the most sacred object in the place. In the Mongolian language it is called *Zandamoto*,[1] but the same word applies to the arborescent juniper and to other useful trees; for *instance*, the walnut-wood stocks of guns are 'zandamoto;' the leaves of the sacred tree are said to be about the size of those of the common lime. The Tibetan letters are of course inscribed by the lamas, or perhaps exist only in the imagination of devout believers. And the tree itself is most probably a native of Kan-su, as it grows in the open air, and can therefore bear the severity of the climate. We attach no weight to the mere fact of its being considered by all Buddhists as sacred and unique; what strange beliefs and superstitions obtain credence even in Europe![2] Kumbum is famed for its school of medicine, in which young lamas destined to practise that art receive instruction. During the summer the students repair to the neighbouring mountains to collect herbs, which are the only remedies known in the Tibetan pharmacopœia. Of course a great deal of hocus pocus is added, but it is not improbable that by these means discoveries unknown to European science are made in the healing art. I think that anyone who had made medical botany his study might pick up some valuable hints were he to turn his attention seriously to the Tibetan and Mongolian practice.

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[1] His *hair* according to Huc (II. 113).—Y.

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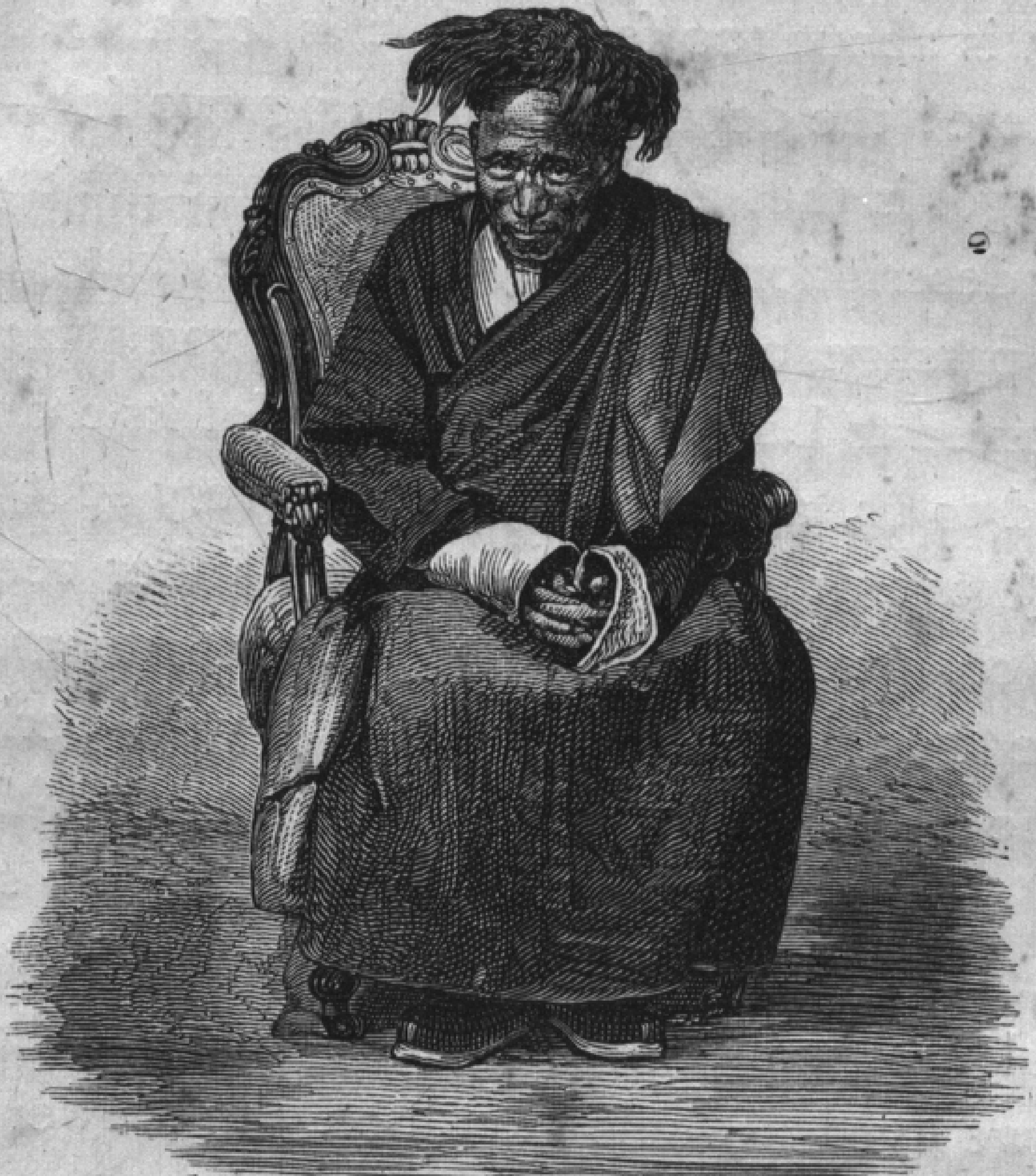
[1] *Chanda?* Is this a corruption of the Sanskrit *Chandana*, sandal wood? *Moto* or *modo* is merely 'wood.'—Y.

[2] Huc, it will be remembered, gives testimony as an eye-witness to this marvellous tree, declaring that the Tibetan characters are found not only on the leaves but on the bark, which detaches like that of a plane-tree. 'We made every search for indications of trickery, but none could we find! and the drops of perspiration burst from our foreheads!' In fact, Huc and Gabet regarded it in good sooth as *opus Sathanæ*.—Y.



TIBETAN LAMA-PHYSICIAN (from a Photograph lent by Baron Osten Sacken).

In former times 7,000 lamas lived at Kumbum, but their number is much diminished since the temple was despoiled by the Dungans, who, however, spared the principal shrine with the sacred tree. Such is the fame of the place that it will doubtless soon be restored.

On leaving our camp to the north-west of Koko-nor our route lay first along the northern and then along the western shore of the lake. After fording a few small streams, we soon approached the largest of its affluents—the Pouhain-gol, which, as the

Mongols told us, rises in the Nan-shan mountains and flows 260 miles before discharging its waters. In its lower course, i.e. where the Tibetan road crosses it, its width is about 100 feet, and it is fordable almost everywhere; the depth not exceeding two feet. The Pouhain-gol is thus a river of very moderate calibre, and the description given by the Abbé Huc of the terrible passage of the Tibetan caravan which he accompanied to Lhassa, across twelve of its channels, appeared to us, as we read it on the very spot, marvellously overdrawn. The worthy father remarks that his companions considered it very fortunate that only one man broke a leg, and two yaks perished. Now, the river has here only one channel, which is flooded only in the rainy season, and might suffice to drown a hare possibly, but certainly never so powerful a swimmer as the yak. In the following March we lived a whole month on the Lower Pouhain-gol, and forded it dozens of times on every shooting excursion, often calling to mind as we did so Huc's description.[1] The valley of this river is from eight to ten miles wide; on the opposite side rises a lofty range which, as the natives told us, extends along the southern shore of Koko-nor,[2] and continues for about 330 miles to the west. I shall call it the Southern Koko-nor range, to distinguish it from the Northern or Kan-su mountains, with which it probably unites at its western extremity.

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[1] Compare Huc's account (vol. ii. p. 199). The river was covered with ice, not strong enough, however to bear the weight of the caravan animals, a circumstance which, combined with the darkness of night, must have occasioned difficulties in the passage, and partly caused the accidents which befell his party. Huc's passage was apparently made in the first week of November.—M.

Just as these latter mountains divide its basin from the moist, hilly, wooded region of Kan-su, so does the southern range define the boundary between the fertile steppes surrounding the lake and the deserts of Tsaidam and Tibet. The northern slopes of this range have many points of resemblance to the Kan-su mountains, and are for the most part covered with shrubs and small underwood, while on the other side their character is completely Mongolian. Here the clay soil is in many parts quite bare, or dotted only with an occasional tree-juniper; the watercourses are dry; and no sign of rich grass-land is visible. Here also the traveller must prepare to enter the desert, which lies on the south, and may be compared in sterility with the plains of Ala-shan. Nothing grows on its saline clay soil but such grasses as the *dirisun*, with *budarhana*, and *karmyk*; its animals, the *kara-sulta* and *kolo-djoro*, are such as only inhabit the wildest deserts. Here lies the salt basin of *Djaratai-dabas*, about twenty-six miles in circumference, presenting a layer of excellent salt, a foot thick in the middle, diminishing to an inch round the edges. The salt is transported hence to Tonkir, its excavation being superintended by a resident Mongol official.[1]

The plain in which this basin lies is twenty miles wide, and extends some distance to the east, bounded on the north by the Southern Koko-nor mountains, and on the south by another parallel chain which unites with the former a little to the west of Djaratai-dabas.

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[1] It is worthy of notice that the salt is paid for on the spot at the rate of two packets (¼ lb.) of *guamian* (a kind of vermicelli prepared from dough) for each camel-load; however, at Koko-nor butter also passes as currency.

Not far from the point of their junction, at the entrance of a narrow defile formed by the Dulan-gol, is Dulan-kit,[1] where Tsing-hai-wang, governor of Western Koko-nor resides. He used formerly to live on the shore of the lake, but the constant depredations of the Tangutans obliged him to remove his camp. One may form an idea of the extent of their robberies from the fact that 1,700 of his horses were stolen in three years. The Wang, i.e. Prince, of Koko-nor died a year before our arrival;[2] leaving as his successor his eldest son, a youth of twelve, whose title had not as yet been acknowledged by the Chinese Government;[3] and his mother, a young energetic woman, acted as regent. We met her with the young prince near Djaratai-dabas, on their way to Tonkir to transact business. The latter eyed us with a sort of stupid curiosity, but the princess demanded our passport, and, after reading it through, remarked to her attendants, that we were perhaps emissaries of the Emperor of China to report everything we saw to him. She then bade them give us guides, and we separated, after an interview which did not last more than half-an-hour.

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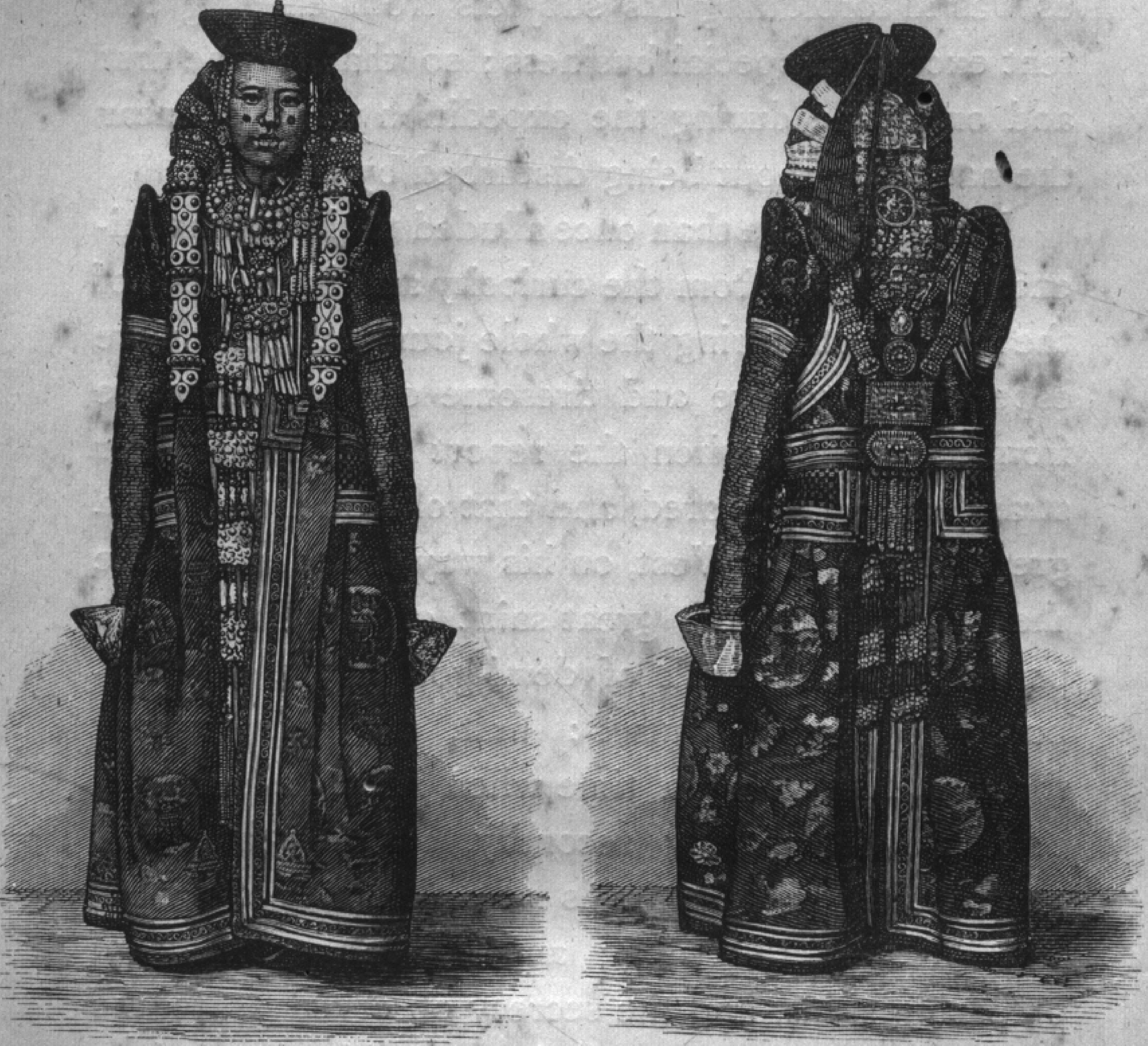
[1] The word 'kit' means a *church*, and there is certainly a small temple at this place. [The river is the Toulain-gol of Huc (ii. 208), where the French travellers found the ruins of a flourishing convent.—Y.]

[2] Both the wangs of Koko-nor are subject to the amban of Si-ning, i.e. the governor of Kan-su.

[3] Tsing-hai-wang died in 1871. A thousand head of cattle, including 300 yaks, were paid for the celebration of his funeral obsequies at different temples; besides which several hundred lans in money



Mongol Princess.
Back View of Mongol Princess.
(From a Photograph lent by Baron Osten Sacken.)

But we received a hearty welcome, at the head-quarters of Tsing-hai-wang, from the uncle of the prince who assists his nephew in the affairs of government. This uncle, a Gigen by profession, once owned a temple, but the Dungans destroyed it. He had been several times to Peking and Urga, where he had met Russians. He was an excellent fellow, and in return for our present to him sent us a small yurta, which was afterwards of great service to us in Tibet. But the greatest kindness he showed us was in forbidding his subjects from entering our tent except on special business; so that for the first and only time during the expedition we lived near the natives without being disturbed by them.

We have more than once alluded to the inconvenience we suffered from the curiosity and impudence of the inhabitants during the whole journey. They were especially intrusive and tiresome on our departure from Koko-nor, when the report spread that four strangers had appeared, and that one of them was a great saint of the West, on his way to Lhassa to see the Dalai-Lama, the great saint of the East. My promotion to the rank of demi-god might be attributed to several causes: first, our safe journey through Kan-su at a time when it was as full as it could be of robbers; secondly, our new-fashioned guns which killed animals at unheard-of distances and birds on the wing; and, lastly, our mode of preparing skins, and the secrecy observed as to the objects of our journey: all these combined to induce the belief among the people that we were mysterious beings. Whenever a person of consequence, such as a Gigen or the Tibetan envoy, paid us a visit, they were more than ever convinced that I must be a great *kubilgan* or saint. This circumstance favoured us to a certain extent, because my reputation for sanctity lessened the difficulties of the road, and thus in a measure removed the obstacles that beset our path; on the other hand, it was necessary to keep up my character by dispensing benedictions, prophesying, and every kind of absurdity. Tangutans and Mongols would sometimes come in crowds to pray, not only to us but to our guns, and the native princes often brought us their children, entreating us to lay our hands upon them, and thus confer a lifelong blessing. As we approached Dulan-kit, a crowd of 200 men assembled to worship us, kneeling down on each side of the road.

I was often consulted in my capacity of prophet, not only as to the future, but in cases of straying cattle or lost pipes, and the like. And one of the Tangutan princes besought us to tell him how to make his barren wife bear children, if it were but two or three! The Kara-Tangutans, who are constantly harrying the region round Koko-nor, not only never dared to attack us, but actually discontinued their raids in the district through which we happened to be travelling. The chiefs of the Mongol banners often applied to us for our assistance to protect them against the robbers, and to order the restoration of their ravished cattle.

The charm which attached itself even to our name exceeded all bounds of probability. Thus on the way to Tibet we left a bag of barley-meal with the Prince of Tsaidam, who gladly took charge of it, assuring us that it would protect him from marauding Tangutans; two months afterwards when we returned, the same prince sent us a couple of sheep in return for the service we had done him; for robbers had been deterred from molesting his banner by apprehensions lest they should steal something belonging to the Russians!

Endless were the absurd stories circulated about us. Thus it was generally believed that though we were but four in number, yet at my bidding a thousand men would rise up and do battle in our behalf; it was asserted that I had power over the elements, and could infect cattle or even men with diseases, &c. And I am firmly convinced that ere many years have elapsed, the story of our journey in those countries will have passed into a legend, adorned with all sorts of imaginative flights.

I had to play not only the saint but the doctor also. The latter title was given me in the early months of the expedition owing to my plant-gathering habits, and to the successful cures which I afterwards performed on some fever patients with doses of quinine; quite enough to convince the Mongols firmly of my powers of healing. My fame spread far and wide throughout Mongolia, Kan-su, Koko-nor, and Tsaidam. In the two latter countries numbers of sick persons, especially women, came to consult me upon their maladies. Being entirely ignorant of medicine, and having only a small supply of drugs, and without either time or inclination for such work, I usually had recourse to one of the most impudent quackeries that ever appeared in the medical world, viz. *Baumsteitismus*, a system which professes to cure every ill that flesh is heir to by punctuating the skin of the affected part with a bunch of needles set on a spring, and afterwards rubbing in an ointment.

I had taken one of these instruments with me, in some kind of prevision of its utility. If Dr. Baumsteit, the inventor of this marvellous panacea, be still alive, he may take pride in learning that his discovery was welcomed with enthusiasm by the inhabitants of Koko-nor, who regarded the needle-spring as a sacred thing received almost direct from Buddha himself! I subsequently presented it to a Mongol prince, who at once began to practise with it on his aides-de-camp, although they had nothing earthly that ailed them.

The most common maladies among the Mongols were syphilis, different skin diseases, and stomach complaints, besides contusions and fractures of bones. The sufferers gave the most ludicrous accounts of their ailments; thus, one woman, whose digestive organs were impaired by an excessive consumption of barley-meal, declared that she had a fungus growing inside her; another that her eyesight had been harmed by the evil-eye, &c.

My patients, however, were not satisfied with the operation of Baumsteitismus only; they asked us to give them internal remedies as well; we usually administered doses of salts, tincture of peppermint, and soda powders, sometimes, as in cases of cataract, magnesia, simply to rid ourselves of them. Our stock of medicines, however, was at last exhausted, and we had to fall back upon the needle-spring, which never failed us to the end of the expedition.

Two days' march from the residence of Tsing-hai-wang we left the mountains behind us. As we crossed the last spurs of the southern range we saw stretching before us the level plain of Tsaidam,[1] bounded on the north, east, and south by mountains,[2] but extending westwards in one continued expanse, as far, according to the natives, as Lake Lob-nor.

The plain of Tsaidam, which at a comparatively recent geological age formed the bed of a huge lake, is now covered with morasses, so thickly impregnated with salt as to be encrusted with a layer in some places half-an-inch to an inch in thickness, resembling ice. Here too are shaking bogs, small rivers and lakes; and in the western part of the plain the large Lake of Kara-nor. The most important of its rivers is the Baian-gol, about 1,600 feet wide where we crossed it, but of inconsiderable depth, in fact, not more than three feet, with a soft slimy bed. According to the Mongols the Baian-gol flows out of Lake Toso-nor at the eastern extremity of the Burkhan Buddha, and after a course of about 200 miles loses itself in the marshes of Western Tsaidam.

The saline argillaceous soil of this region is ill-suited to vegetation. With the exception of a few kinds of marshy grasses, which in places grow together and form meadows, the whole expanse is covered with reeds four to six feet high.[1] On the drier ground *karmyk* (*Nitraria Schoberi*) abounds, such as we had seen in Ordos and Ala-shan, but growing here to a height of seven feet. Its sweet saline berries are plentiful, and, like the fruit of the *sulhir* in the Ala-shan, form the staple food of the inhabitants. The Mongols and Tangutans supply their wants for the whole year by collecting these berries late in autumn, when they hang dry on the twigs, boiling them in water, and eating them with barley-meal. They also drink the sweet brackish liquor in which the berries have been boiled. Many birds and beasts, including wolves and foxes, feed on these berries, and camels are particularly fond of them. Large animals are, however, scarce in Tsaidam, probably owing to the crust of salt on the surface of the ground, which injures the soles of their feet and their hoofs. Now and then a *kara-sulta* or a *kulan* (wild ass) may be seen, or more often a wolf, fox, or hare. The small number of animals is in part due to the myriads of mosquitoes, midges, and gadflies, which at certain seasons of the year oblige even the natives to retreat to the mountains with their herds.[2] The birds of Tsaidam belong chiefly to the orders of Swimmers and Waders; but as we passed through this country late in autumn and early in spring we saw very few of either kind. There was, however, a new pheasant in large numbers distinct from the Kan-su and Mongol species. We also found a few wintering birds, such as the *Ruticilla erythrogastra*, *Carpodacus rubicilla*, *Buteo aquilinus*, *Falco Hendersoni*, *Circus Cyaneus*, *Anthus pratensis*? *Anas boschas*, *Rallus aquaticus*.

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[1] The boundary of Tsaidam lies a little over sixteen miles to the south of Dulan-kit.

[2] On the north, by the western continuation of the Southern Koko-nor range, on the south by the Burkhan Buddha mountains of Tibet, and on the east by some transverse chains which unite the two systems.

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[1] Compare Huc's account, page 209 of vol. ii., which does not differ much from that of the author, except that he omits to mention the marshes and reeds, and calls the Baian-gol the Tsaidam River.—M.

[2] It is remarkable how seriously the cattle suffer from the insects; the sheep and other domesticated animals become much thinner than in winter when the food is not so rich, but when they are free from the torment of flies and mosquitoes.

The inhabitants of Tsaidam are the same as those of Koko-nor—Mongols and Kara-Tangutans; the latter, however, only inhabiting the east of the country. For administrative purposes Tsaidam is included in the Koko-nor region; and is divided into five banners: *Kurlik*, *Burun*, *Tsung*, *Koko-behleh*, and *Taiji*. According to the account we heard from a native prince the population numbers 1,000 yurtas, i.e. 5,000 to 6,000 men and women, taking the average of five or six to a yurta. The Mongols told us that the marshes extended for fifteen days' march WNW. from the point where we crossed them; and that beyond lay a tract of bare clay, after which the country again became steppe-like, abounding in water and pasturage known by the name of *Gast*. The only living creatures in these regions are the *kulans*, or wild asses; and hunters come from Lake Lob-nor, only seven days from the Gast country, in search of them. We were assured by the natives that Lob-nor was only a month's journey, i.e. 500 to 600 miles, from that part of Tsaidam in which we were. Guides may be obtained here on payment of a good sum, to take one, at all events, as far as Gast, whence there is no difficulty in getting to Lob-nor.[1]

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[1] Mr. Ney Elias remarks that the approximate position of Lob-nor

Such a journey as the one we have just mentioned, besides its geographical interest, would finally set at rest the question of the existence of wild camels and horses. The natives repeatedly told us of the existence of both, and described them fully.

According to our informants wild camels are numerous in North-western Tsaidam, where the country is barren, the soil being clay, overgrown with *budarhana*, and so destitute of water that they have to go seventy miles to drink, and in winter are obliged to satisfy their thirst with snow.

The herds are small, averaging five to ten in each, never more than twenty. Their appearance is slightly different from the domesticated breed; their humps are smaller, the muzzle more pointed, and the colour of the hair grey.

The Mongols of Western Tsaidam hunt them for the sake of their delicate flesh, especially in autumn when they are fat. The hunters supply themselves with ice to avoid perishing from thirst in the wilderness. These camels cannot be very shy if it be true that they may be killed with the matchlock. They are described as wonderfully long-sighted and keen-scented, but unable to see objects near them. In February, during the pairing season, the males become very bold and approach close to the caravans passing from Tsaidam to Ngan-si-chau. Caravan camels have been known to elope with their wild mates, never returning to their owner.

lies between that deduced by Père Gaubil from a Chinese itinerary based on Hami and Mr. Shaw's carefully drawn up itineraries converging on that lake from several sides. See 'Proceedings of the Royal Geographical Society,' vol. xviii. No. 1, note on page

Before we entered Tsaidam we had heard of wild camels in the country of the Tangutans, and in the desert between Lob-nor and Tibet. Shaw[1] also heard of them on his journey from India to Yarkand, and they are also mentioned by Chinese writers. But of what breed are they? Were their ancestors wild, or are they descended from some which escaped to the desert, ran wild, and multiplied? This question cannot be decided on the unsupported testimony of the natives, but we think that the fact that the domestic camel cannot propagate without human assistance argues for an original wild stock.[2]

Wild horses, called by the Mongols *dzerlik-adu*,[3] are rare in Western Tsaidam, but more numerous near Lob-nor. They are generally in large herds, very shy, and when frightened continue their flight for days, not returning to the same place for a year or two. Their colour is uniformly bay, with black tails and long manes hanging down to the ground. They are never hunted owing to the difficulties of the chase.

The plains of Tsaidam are 1,700 feet below Koko-nor, and on this account the climate is warmer. The absence of water also tends to increase the heat.

About the end of October, when we left Kan-su, and all through November, the autumnal weather was fine and clear, and though the night frosts were sharp (– 9° Fahr. in October, and – 13° Fahr. in November) the days were warm[1] when the sun shone and there was no wind, and we enjoyed it the more after the constant rain and snow in Kan-su. Towards the end of October Lake Koko-nor remained unfrozen, only some of the smaller bays being covered with ice, but a month later the rivers, including the Baian-gol, were ice-bound. Very little snow fell, and the little that did fall soon disappeared under the combined influence of sun and wind.[2] The natives said that even in winter snow was rare in Tsaidam and Koko-nor; in Kan-su, where the weather is generally clear at that season, it snows but little.

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[1] 'High Tartary, Yarkand, and Kashgar,' by Robert Shaw, page 168. See also the note on that page. [See remarks in Introduction to the work.]—M.

[2] Domesticated animals may perhaps acquire this faculty after they have been set at liberty for some years.

After taking our leave of the Tsing-hai-wang, we crossed a barren saline plain, in which are the two salt basins of Sir-ho-nor and Dulan-nor, after which we ascended a spur of the southern range, whence we saw the plain of Tsaidam in our front, and the Burkhan Buddha mountains, which rose like a wall, beyond it. The atmosphere in autumn is so clear that with the naked eye we could see the mountains although eighty miles off, and with a field-glass we could make out almost every cliff.

Before entering the salt marshes we crossed a wide undulating plain which connects them with the high border-land. Here the soil is clay and shingle, with occasional sand drift, where the *saxaul*, characteristic of Ala-shan, at once appears. The clay flats were for the most part entirely barren, bushes of karmyk and tamarisk only growing here and there.

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[1] The first day that the thermometer descended below the freezing-point at 1 P.M. was November 9.

[2] The snow here and in Kan-su is so dazzling that the inhabitants, as they have no spectacles, bandage their eyes with blinkers made from the black tail of the yak.

A rare sight now met our eyes, for we came upon a few acres of cultivated land sown with barley and wheat. The largest plot of this cultivation covered from twenty to thirty acres near the encampment of Tsing-hai-wang, to whom it belonged. Agriculture is of quite recent introduction in Tsaidam, dating only from the time when, owing to the Dungan insurrection, communications with Tonkir were cut off, and the inhabitants could not obtain the needful supplies of the barley which forms their staple food.

Our course lay across nothing but salt marshes for 40 miles. There are no tracks here, and we steered in a straight line, first over the bare salt crust, and then over frozen clay. It was painful walking for the animals; some of the camels were lamed by it, and the dogs could hardly put their bleeding feet to the ground.

On November 30 we reached the station of the governor of the banner of Tsung-zasak, whence the Gigen of Koko-nor had directed that we should be supplied with guides to Lhassa. We concealed the abandonment of our intention to go so far, in order to avoid suspicion. The prince hesitated for some time before selecting a guide for us. At length a Mongol, by name Chutun-dzamba, who had been nine times to Lhassa with caravans, came to us. After a long consultation and the usual tea-drinking, we hired the services of this old man at the cheap rate of seven lans per month, with food and a riding camel provided by us. We further promised him a present if he discharged his duties zealously; and the next day we started for Tibet with the intention of advancing through that unknown country to the upper waters of the Blue River.[1]

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[1] i.e. of the Yangtse-Kiang. I do not know whence the name *Blue River*, commonly used by French authors, and here by a Russian, has been taken.—Y.

CHAPTER VI.

NORTHERN TIBET.

The Burkhan Buddha mountains; the effects of a rarefied atmosphere—M. Huc's 'vapours of carbonic acid gas'—The Nomokhun stream—The Shuga mountain range and river—Tibetan frontier—The Urundushi mountains—Sources of the Hoang-ho, and pilgrimage thereto—The Baian-kara-ula range—Character of the desert plateaux of Tibet—Extraordinary exhaustion produced by exertion at high altitudes—Caravans to Lhassa—Time occupied on the journey—Dangers and hardships of the road—Abundance of animal life — Mammals—The wild yak; its habits; its physical defects and low intelligence; disease to which it is subject—Wild yaks hooting—The animal hard to kill—Grandeur of the sport—Mode of stalking—They rarely charge—Examples of yak-shooting—The yak-meat—The white-breasted Argali — The Orongo (*Antilope Hodgsoni*)—Large herds of these antelope — Their unwary habits—Held sacred by Mongols—Unicorns — The *ata-dzeren*, or little antelope—Its amazing swiftness—The Tibetan wolf (*Lupus Chanco*)—The fox (*Canis Corsac*)—Birds of Northern Tibet—Progress of journey—Travelling yurta—Intense cold—Tattered garments—Rarefied atmosphere—The halt—Preparing dinner—Long nights—Sport on the plateau—Climate—Dust-storms—Chutun-dzamba—Arrival at the Murui-ussu—Limit of the expedition—Necessity for return.

THE Burkhan Buddha range forms the southern boundary of the marshy plains of Tsaidam, and at the same time the northernmost limit of the lofty plateau of Northern Tibet. Its length (according to what we were told by the inhabitants) is about 130 miles from east to west, and while its eastern extremity is near the Yegrai-ula[1] mountains and Lake

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[1] The Yegrai-ula range is not far from the sources of the Yellow River; according to the Mongols it is not covered with perpetual snow,

Toso-nor, it is defined on the west by the course of the Nomokhun-gol, which flows from its southern foot, sweeps round the western end and enters the Tsaidam plain, where it joins the Baian-gol.[1] The Burkhan Buddha is, therefore, a distinct range, more particularly on the north, where it rises boldly from the perfectly level plains of Tsaidam; it has no very conspicuous peaks, but extends in one unbroken chain.

The Mongol tradition regarding the origin of the name 'Burkhan Buddha,'[2] dates several hundred years back, when a certain gigen happened to be returning to Mongolia from Tibet, and, after encountering all the horrors of the Tibetan deserts, descended in safety to the warmer plains of Tsaidam; desirous of showing his gratitude to the Divine Being, he named after Buddha himself that range which, like a giant watchman, keeps guard over the adjacent cold and sterile highlands. These mountains are indeed a distinguishing physical feature of this region. To the south of them the elevation is from 13,000 to 15,000 feet[3] the whole way to the head waters of

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but is well wooded. Lake Toso-nor is narrow, but about forty miles, or two days' journey, in length. The Baian-gol flows out of it.

[1] The Nomokhun-gol flows from the Shuga mountains in a narrow channel; at its confluence with the Baian-gol the Mongols say there are some old ruins, formerly occupied by Chinese troops.

[2] This name means 'god Buddha.' [Since *Burkhan* is a word commonly used by the Mongols as the *synonym* of 'Buddha,' it is probable that the name as given by Huc is more correct, viz. *Burkhan Bota*, which that traveller interprets as 'Buddha's Kitchen,' connecting the name with the supposed mephitic gases which he speaks of there, ii. 212.—Y.]

[3] With the exception of the narrow gorge of Nomokhun-gol, which intersects the plateau.

the Yangtse-kiang, and considerably beyond these to the Tang-la mountains, which in all probability are even higher than the Burkhan Buddha.

The ascent from the foot to the chief axis of the range is about twenty miles,[1] rising by a gentle incline until within a short distance of the summit (15,300 feet), where it becomes steeper. The nearest peak, and also the highest in the whole range[2] (if we may believe the Mongols), also bearing the name of Burkhan Buddha, rises 16,300 feet above sea-level, and 7,500 above the Tsaidam plain.

Yet notwithstanding its great height, the Burkhan Buddha does not attain the limit of perpetual snow; even when we crossed in the beginning of December there was but a slight covering, a few inches in depth, on the northern slopes of the highest summits and of the axis of the range itself, and on our return march, early in spring, we saw no snow of the previous year unmelted, even in those gorges well sheltered from the sun.

This phenomenon is explained by the circumstance that, although at a great elevation above the sea, these mountains rise very slightly above the exposed plains to their south, and the currents of wind passing over the surface of the latter, after they have been thoroughly warmed by the summer sun, drive the snow off the very highest summits. Moreover in winter the snowfall is very slight,[1] and although heavier in spring it soon thaws in the sun, without having time to drift into more compact masses, such as might last throughout the summer. The extreme barrenness of the Burkhan Buddha is its most prominent characteristic. The slopes are of clay, small pebbles, *débris* or bare rocks of schist, syenite, or syenitic porphyry; the latter are most marked on the borders and along the axis of the range. Vegetation is almost exclusively confined to stunted bushes of *budarhana* and yellow kurile tea; birds and beasts are also rare.

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[1] Between the foot of the mountains and the salt marshes of Tsaidam there is an intervening strip, ten miles wide, of sloping gravelly ground, completely devoid of vegetation and dotted with boulders.

[2] This is hardly correct, I think; some of the other peaks are higher than the one I measured, although perhaps only a few hundred feet.

The southern slopes are in general somewhat less sterile than those facing the north; here too running streams are more abundant, and something like grass may be seen. But the herbage is soon eaten off by wild animals, or by the Mongol cattle driven hither during summer to escape the swarms of insects which infest the Tsaidam marshes.

Notwithstanding the gradual nature of the ascent, the exertion to both man and beast was very severe, owing to the enormous elevation, and the consequent rarefaction of the atmosphere. Our strength failed us, a feeling of languor supervened, respiration became difficult, and our heads ached and grew dizzy. Camels frequently fall down dead here; indeed one of our own expired on the spot, whilst the others were only just able to surmount the pass.[1]

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[1] The Mongols told us that the snowfall was very unequal. One winter there would be more, another less.

The descent from the pass was even more gradual than the ascent. It continued for fifteen miles, and terminated at the stream called Nomokhun, flowing in a gorge of which the height above the sea was 11,300 feet. And this was the lowest elevation in the whole of our route across Northern Tibet. Beyond the Nomokhun the ground gradually rises to another range, the Shuga (Chouga), lying parallel with the Burkhan Buddha and terminating as abruptly on the west, where it abuts on the Tsaidam plains.[2] This range is somewhat longer than the preceding. It commences with the Urundushi mountains on the east, where the Shuga-gol also rises. This stream is 280 feet wide[3] where we crossed and shallow throughout; it flows with a course of 200 miles (so the Mongols told us) along the southern foot of the range, and then disappears in the marshes of Western Tsaidam. Its valley, like that of the Nomokhun-gol, is grassy and fertile, compared with the sterile mountains on either side.

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[1] In his description of these mountains (ii. 210–212), Huc says that the range is remarkable for the presence of noxious gases on its northern and eastern face. He continues to relate how he himself and his companions felt the injurious effect of these gases on the pass. An exactly similar description may be found in a translation of a Chinese itinerary from Si-ning to Lhassa (Trans. of the Russ. Imp. Geogr. Soc. 1873, vol. ix. pp. 298–305), where it is said that in twenty-three places on this road deleterious exhalations, '*chan-tsi*,' are met with. We were for eighty days on the plateau of Tibet and never once experienced the 'pestilential vapours' or exhalations of 'carbonic acid gas.' The difficulty of marching here as well on the perfectly level parts of Northern Tibet, the catching of the breath, fatigue and giddiness, are of course attributable to the enormous elevation and rarefaction of the air at those altitudes. This also accounts for the argols burning so badly. Again, if there really were carbonic acid, or other noxious gases, how could the Mongols live there in summer with their herds, or how could the vast troops of wild animals pasture here and farther in the desert? [See also remarks in Introduction.]

[2] In all probability these two ranges, i.e. the Burkhan Buddha and Shuga, unite in the extreme west, where they abut on Tsaidam.

[3] This was the width of the ice in the channel in winter; the stream itself is probably much narrower.

The Shuga range closely resembles the Burkhan Buddha. Here we find the same absence of life, the same bare slopes varying in colour and shade according to the nature of the clay, or of the rocks which cover them. Huge crags of limestone and epidote are piled on their summits, but by the Tibetan road the ascent and descent are gentle, although the absolute elevation is greater than that of the more northerly range.[1] In the centre of this chain five isolated peaks attain the limit of perpetual snow.[2]

This range forms the political boundary between Mongolia (i.e. the Tsaidam district) and Tibet. But the frontier is not laid down with accuracy, and the Tibetans claim the territory up to the Burkhan Buddha. Serious disputes, however, are not likely to arise, because for a distance of 530 miles along the Tibetan road, i.e. from the Burkhan Buddha to the southern slopes of the Tang-la, there is no population whatever.[1] The Mongol name for this region is '*guressu-gadzir*,' or 'country of wild beasts,' from the abundance of animals which exist here in a state of nature, and which we shall have occasion to speak of presently.

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[1] The pass over the Shuga is 15,500 feet.

[2] These five peaks were about five miles to the east of our line of march; their apparent height above the pass is 2,000 feet; in the middle of December and middle of February snow lay in quantities on their northern slopes, and on the south in a narrow belt only, near the very highest summits.

The group of the Urundushi mountains, from which the Shuga range diverges, rises on the north of the plain of *Odon-tala*,[2] famous for its springs, and known to the Chinese under the name of *Sing-su-hai* or 'Starry Sea.' Here are the sources of the celebrated Hoang-ho, only seven days' journey from the point where we crossed the Shuga range, but unfortunately our guide did not know the road. Every year in the month of August the Mongols of Tsaidam make pilgrimages to Odon-tala to offer sacrifices and pray there. Their offerings consist of seven white animals (a yak, a horse, and five sheep) decked with red ribbons and let loose in the mountains. What becomes of them afterwards is not known, but it is not impossible that they are slain by Tangutans or devoured by wolves. About seventy miles to the south of the Shuga range rises a third chain of mountains, called by the Mongols Baian-kara-ula,[1] and by the Tangutans *Yegrai-vola-daktsi*; they are situated on the left bank of the headwaters of the Blue River, called by the Mongols Murui-ussu,[2] and from the watershed between its basin and that of the sources of the Hoang-ho.

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[1] With the exception of 500 Tangutans encamped, as the Mongols informed us, in the valley of the Murui-ussu (Blue River), six days' journey from its confluence with the Napchitai-ulan-muren. [*Murui-Ussu* signifies in Mongol, according to Klaproth as well as Huc, 'Tortuous River.' It is the *Bri-chu* of the Tibetans, the *Brius* of Marco Polo, and as already stated the upper stream of the Yangtse.—Y.]

[2] This plain is two days' journey in length; to the south lie the *Soloma* mountains, forming the eastern part of the Baian-kara-ula range.

The general direction of this range is from east to west, but it is known by different names in its several parts. In this way its western extremity, as far as the *Napchitai-ulan-muren*,[3] is called *Kuku-shili*; its central part is the *Baian-kara-ula* proper, beyond these again are the *Daktsi*, and on the extreme east the *Soloma* mountains. The Mongols informed us that no part of the range attained the limits of perpetual snow. The Kuku-shili is about seventy miles long, the other three chains together upwards of 260 miles in extent, giving a total of about 450 miles for the length of the entire range. Its central portion follows the course of the Blue River, while on the east and west it diverges from it.

The Baian-kara range is distinguished from the Burkhan Buddha and Shuga mountains by its softer outline and comparatively lower elevation. On its northern side (at all events where we saw it) the range rises only 1,000 feet above the base, but the counter slope facing the south presents a bold precipitous front to the valley of the Murui-ussu, where the elevation is 13,000 feet above sea-level. The rocks are mostly siliceous slate and felspathic porphyry. There are hardly any cliffs or chasms on the north; water is abundant, and the southern side is beyond comparison more fertile than any part of Northern Tibet that we saw. The soil is sandy, but owing to plentiful moisture the valleys and slopes are well clothed with grass.

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[1] The meaning of this name is 'rich black mountains.'

[2] [The 'Blue River,' as already observed, is the Yangtse-kiang.—Y.]

[3] This river flows from the snowy mountains of *Tsagan-nir*, and after a course of about 230 miles falls into the Murui-ussu. The width of its lower channel in winter is from 210 to 280 ft.; it is remarkable that its water is brackish to the taste.

Between the Shuga and Baian-kara-ula chains lies a terrible desert 14,500 feet above the level of the sea,[1] for the most part undulating, dotted here and there with groups of hills hardly more than 1,000 feet above the plain.

The only snowy mountains are the *Gurbu-naidji* (in Tangutan *Achiun-gonchik*),[2] lying towards the north-west, and which would seem to form the commencement of the Kuen-lun system. For the Mongols say that a continuous succession of mountains extends hence a long way to the west, now rising above and again sinking below the snow-line. In the eastern part of this system, other snowy peaks besides the Gurbu-naidji rise from the groups of *Yusun-obo* and *Tsagan-nir.*

The elevated plateau between the Shuga and Baian-kara-ula chains is typical of the deserts of Northern Tibet in general. The climate and natural character of this region are simply awful. The soil is clay mixed with sand or shingle, and almost devoid of vegetation. Here and there a tuft of grass or a patch of grey lichen may be seen covering a foot or two of the surface, which in many parts is coated with an efflorescence of salt as white as the driven snow, and seamed in all parts by deep furrows caused by the violent and constant tempests. It is only in those spots where springs rise to the surface that verdure and an approach to grass-land may be seen. But even these oases bear the death-like stamp of the surrounding desert. The grass is all of one kind of *Gramineæ*,[1] half a foot high, as hard as wire, and so parched by the wind that it crackles like straw under foot and falls to powder.[2]

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[1] Lake *Bukha-nor* is 14,000 ft., and the *Heitun-shirik* swamp at the northern foot of the Baian-kara-ula, 14,900 ft. above sea-level.

[2] These mountains were forty miles to the west of our route.

The exhaustion consequent on the enormous elevation affects the strongest man. A short march, or even the ascent of a slight eminence, produces languor, giddiness, trembling of the hands and feet, and vomiting. Argols burn so badly owing to the want of oxygen in the air that it is difficult to light a fire, and water boils at sixty degrees Fahrenheit below boiling point at sea-level.

The climate, too, is in complete harmony with the sterility of these wilds. The winter is bitterly cold and tempestuous; the gales in spring are accompanied by hailstorms; the summer rains are also mingled with large hailstones; and it is in autumn alone that the weather becomes clear, still, and warm. This is the season selected by the caravans for their pilgrimages to Lhassa.[1] The *rendezvous* is Lake Koko-nor, where the camels, which have already accomplished a long journey, are fed up in preparation for the still longer and more arduous march before them. Here too the pilgrims are joined by Mongols of the vicinity, mounted some on yaks and some on camels. The latter travel more rapidly, averaging twenty miles a day,[2] and accomplish the entire distance of 1,000 miles from Tonkir to Lhassa in two months, while the progress on yaks is much slower, occupying double the time.

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[1] As rare exceptions, some of the order of *Compositæ* may be seen.

[2] As a proof of the hardness of the turf in the grassy parts of these deserts, I may mention that our camels often spiked their feet till the blood flowed, notwithstanding the thick soles with which they are protected.

There is no regular road anywhere in the Tibetan deserts, nothing but the tracks of wild animals in all directions. The caravans take a straight course, guiding their march by the salient features of the country. The route is as follows: from Tonkir along the northern shore of Koko-nor, and across Tsaidam, to the Burkhan range, a journey of fifteen or sixteen days; to the Murui-ussu, ten days; ascending the course of this river, ten days more; across the Tang-la range to the Tibetan village of Napchu, five days; and thence to Lhassa, twelve days. The camels are usually left behind at Napchu, on account of the steepness of the mountains, and the journey is continued on yaks. The Mongols, however, assured us that it was possible to travel to Munhu-tsu[1] (Lhassa) itself on camels, but that pilgrims left theirs at Napchu because no good pasturage could be found beyond.

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[1] The Dungan insurrection put a stop to the pilgrimages from Northern Mongolia for eleven years, during which time caravans proceeded only from Koko-nor and Tsaidam, and this not every year.

[2] There are only two halting-places; one in Tsaidam at the foot of the Burkhan Buddha, and the other on the bank of the Murui-ussu.

Caravans leave Koko-nor or Tonkir early in September,[2] to arrive at Lhassa in the beginning of November. Here they remain two or three months, and start on the return journey in February. They are then usually accompanied by Tibetan merchants, who take cloth, lambskins, and various other commodities, to sell at Tonkir and Si-ning. In former years an envoy from the Dalai-Lama was sent every three years with presents for the Emperor at Peking, but since the outbreak of the insurrection these embassies have been discontinued.

The caravan journey across Northern Tibet in the autumn and spring of the year is never unaccompanied by danger; and casualties to men and beasts are frequent. So many of the latter perish that a large reserve of camels or yaks is always taken; but notwithstanding this precaution, the men have sometimes to abandon all they possess, and to think only of their own safety. In February 1870, a caravan which left Lhassa 300 strong, with 1,000 beasts of burden, in a violent snow-storm, followed by severe cold, lost all the animals and fifty men besides. One of the survivors related to us how, when they found that their beasts were dying by the score every day, they were compelled to abandon first their merchandise, and such things as were not absolutely indispensable, then part of their supplies, until they were actually reduced to trudge on foot and to carry their own food on their backs. Of the entire force of camels only three were kept alive by feeding them on barley. The argols were buried so deep beneath the snow that it was almost impossible to find them, and the travellers had to cut their clothes to pieces and burn them for fuel to keep themselves warm. Every day one of their number fell down dead, and the sick were left to their fate.

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[1] We find in Huc and Gabet *Monghe djo*, interpreted as signifying 'Eternal Sanctuary,' applied to Lhassa. The words are misprinted *Mouhe dehot* in Huc, ii. 240.—Y.

[2] But rarely in winter or summer: it sometimes snows heavily

But notwithstanding their sterility and the unfavourable conditions of climate, the deserts of Northern Tibet abound with animal life. Had we not seen with our own eyes it would have been impossible to believe that in these regions, left so destitute by nature, such immense herds of wild animals should be able to exist, and find sufficient nourishment to support life by roaming from place to place. But though food is scarce, they have no fear of encountering their worst enemy, man; and far removed from his bloodthirsty pursuit, they live in peace and liberty.[1]

The characteristic animals belonging to the order of Mammalia, which are most numerous in the Tibetan deserts, are the wild yak (*Poëphagus grunniens*), the white-breasted argali (*Ovis Poli?*), the kuku-yaman (*Ovis Nahoor*), the antelopes called orongo and ata (*Antilope Hodgsoni* and *A. picticauda*), the kulan or wild ass (*Equus Kiang*), the grey wolf (*Lupus Chanco*). Besides which are the bear (*Ursus* sp.) the manul (*Felis manul?*),[1] the fox (*Canis vulpes*), the steppe fox (*Canis Corsac*), the hare (*Lepus tolai*), the marmot (*Arctomys* sp.) and two kinds of lagomys (*Lagomys* sp.).

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[1] The rarefied atmosphere apparently has no effect on the Tibetan

We had already seen some of these animals in Kan-su and Koko-nor: I will, therefore, confine the following remarks to those which are peculiar to Tibet, amongst which the wild yak or long-haired ox of course takes the first place.

This handsome animal is of extraordinary size and beauty, measuring when full grown eleven feet in length, exclusive of its bushy tail, which is three feet long; its height at the hump is six feet; girth round the centre of the body eleven feet, and its weight ten or eleven hundredweight. The head is adorned with ponderous horns, two feet nine inches long, and one foot four inches in circumference at the root. The body is covered with thick black hair, which in the old males assumes a chestnut colour on the back and upper parts of the sides, and a deep fringe of black hair hangs down from the flanks. The muzzle is partly grey, and the younger males have marks of the same colour on the upper part of the body, whilst a narrow silvery grey stripe runs down the centre of the back. The hair of young yaks is much softer than that of the older ones; they are also distinguishable by their smaller size,[1] and by handsomer horns with the points turned up, whereas those of the older males are turned more inwards, and are always covered near the root with dun-coloured wrinkled skin.

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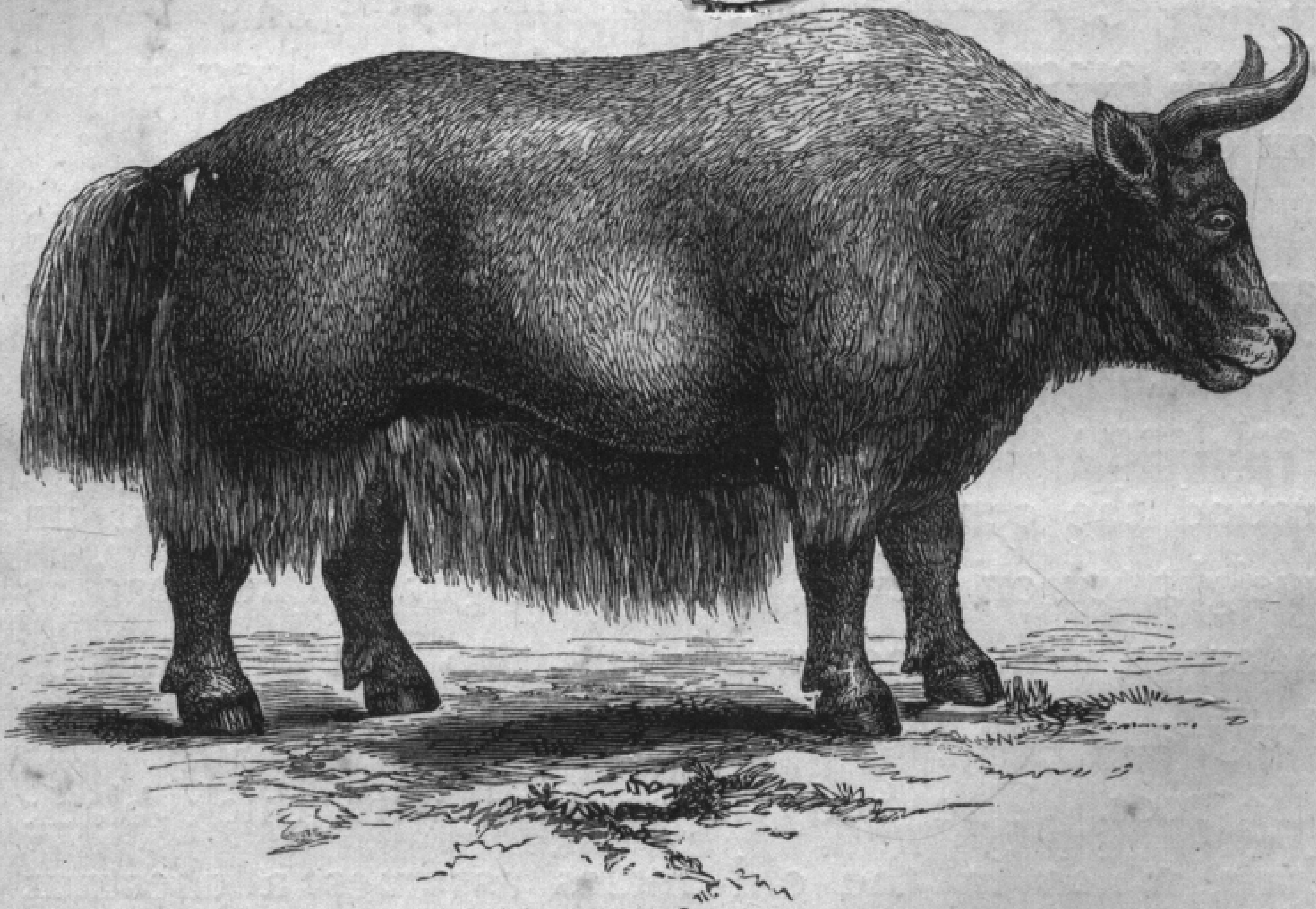
[1] We ourselves did not see either the manul or the bear, but we were told about them by some hunters in Tsaidam; and I once saw a footprint in the snow, which the guide declared to be that of the manul. (See Supplementary Note.) Bears were dormant for the winter, but it is said they are very numerous in the Burkhan Buddha and Shuga ranges. Judging from the description given us, they must be of the same species as the bear of Kan-su

The females are much smaller than the males,[2] and not nearly so striking in appearance; their horns



THE WILD YAK (*Poëphagus grunniens.* Pall.).

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[1] A six-year-old bull is only 9½ feet long, not measuring the tail, and is altogether a smaller animal than the old one.

[2] An old cow-yak is 7 ft. 3 in. without the tail; height at the hump 4 ft. 9 in.; girth round the middle of the body 7 ft.; weight one half or one third that of the male.

are shorter and lighter, the hump smaller, and the tail and flanks not nearly so hairy.

But in order to have a correct idea of the yak, he should be seen in his native state, on vast plains which lie at an elevation of 15,000 feet, seamed with rocky ridges as wild and barren as the surrounding deserts, where the scanty herbage finds little encouragement to grow, owing to the constant cold and the violent storms of wind which rage throughout the greater part of the year. In these inhospitable wastes, in the midst of a desolate nature, yet far removed from pitiless man, the famous long-haired ox roams in unrestricted freedom. This animal, peculiarly characteristic of the highlands of Tibet, is also found further north, and is said to haunt in considerable numbers the mountain ranges of Kan-su near the headwaters of the Tatung and Etsina, the northernmost limit of its distribution. In Kan-su, however, it is becoming extinct, owing to the way in which it is persecuted by the native hunters.

In some physical qualities the yak is singularly inferior to other wild animals. Endowed with enormous strength and an excellent sense of smell, its sight and hearing are defective. Even on a clear day, and on perfectly level ground, it cannot distinguish a man at any great distance, and in misty weather it cannot see him when comparatively near. Again, it requires a very loud noise to attract its attention; but its sense of smell is very keen, and it will scent a man half-a-mile to windward.

Its intelligence, like that of the bovine tribe in general, is of a very low order, a fact which is indicated also by the remarkably small size of its brain.

At all other times, except the rutting season, the old bulls[1] keep single, or in small troops of three or five; younger fully grown males (six to ten years of age) occasionally join their older companions, but are more often found in separate troops of ten or twelve, with one or two old bulls among them. The females, young bulls, and calves assemble in enormous herds of several hundred or a thousand head. In such large numbers they have difficulty in finding sufficient food, but the calves are thus best protected from the attacks of wolves.

While browsing they generally scatter over the pasture, but when reposing lie close together.[2] When in danger they form a phalanx, the calves in the centre, some of the full-grown males advancing to reconnoitre. If the cause of the alarm be apparent, and the hunter continue his approach, or if a shot be fired, the whole herd takes to flight at a trot or gallop, raising a cloud of dust, and the sound of their hoofs is heard a long way off. This furious pace, however, does not last long; after a flight of less than half a mile they slacken speed, and halt in the same order as before, i.e. the young in the centre, and the older males outside. If the hunter again approach, the same tactics are repeated, and once alarmed they will flee a long way.

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[1] It is said that the wild yak lives to the age of twenty-five.

[2] During a violent storm the yak usually lies down.

Solitary yaks always trot, and never gallop more than a few paces from the spot whence they have been disturbed. They may be easily overtaken by a horseman, at whatever pace they may be going. They climb nimbly over the loftiest and rockiest mountains, and we have seen them in places where no other animal, unless it were the kuku-yaman, could find a footing.

In winter large herds repair to the places where pasturage is most abundant, while solitary bulls or small troops may be seen in all parts. We first saw single animals soon after crossing the Burkhan Buddha, but it was not until we came to the Baian-kara-ula, and particularly on the southern slope of this range, that we saw herds of them, and again, in the valley of the Murui-ussu; previously we had seen two small troops near the river Shuga.

The Mongols told us that in summer, when the tender young grass shoots up, large herds of yaks visit the Burkhan Buddha, roaming from place to place, but always returning for the winter to the banks of the Murui-ussu; old bulls, which dislike making long journeys, remain all the year round at the same place. Indolence is a prominent trait in their character. They feed morning and evening, passing the rest of the day in unbroken repose, either lying or standing; at such times the only sign of life they show is in chewing the cud, otherwise they are as motionless as statues, even keeping the head in one position; and this for hours together.

They always select the coldest spot they can find for repose, or seek the shelter of some cliff where they can avoid the sun's rays, preferring to lie on the snow, or if there be none, on the bare ground, in which they scrape a hollow with their hoofs.

Their favourite resorts are thickly strewn with their dung, which is the only fuel in these deserts, and without which the journey across Tibet would be impracticable, for there are no bushes of any kind in this country.

The wild yaks require plenty of water, and their numerous tracks and droppings near the warm springs prove the frequency of their visits to them; when water is unobtainable they slake their thirst with snow. But in summer they are at no loss, for besides an abundance of streams and springs, plenty of rain water collects in the pools, by the side of which grass is abundant, and the yak, by no means a dainty feeder, after growing thin during winter, becomes fat again in autumn; this is particularly the case with young bulls and single cows.

The breeding time, which is in September, lasts a whole month, and then the character of the yak undergoes a complete change. At this season the bulls wander day and night over the plains in search of mates, and engage in sanguinary battles with one another. These fights must often be of a desperate kind, judging from the fact that nearly all those that we shot in winter bore the marks of wounds inflicted in these amorous duels, some of the scars being very large; one bull that we shot had one of its horns broken off close to the head. I leave my readers to imagine how terrific the crash must have been to break off the huge thick horn of one of these animals. What powerful heads to receive and deliver such a blow!

The Mongols said that during the rutting season the bulls constantly uttered a grunting noise; this is most probable, because the domesticated yak grunts like a pig; but we did not hear it once; indeed, at any other season except the pairing time it is very uncommon.

The Mongols say that the calves are born in June, and that a cow will only bear every alternate year.

Gifted with enormous physical strength, the yak in its native deserts, far from the haunts of men, has no dangerous enemies, and dies generally of old age. But he is subject to a kind of mange, called in Mongolian '*homun*,' which spreads over the whole body, and causes the hair to fall off. I cannot say whether they ever recover from this complaint, or whether in time it proves fatal, but I myself shot two yaks which had lost a great deal of hair and were covered with the scab.

Wild yak-shooting is as exciting as it is dangerous, for a wounded beast, especially an old bull, will often attack his pursuer. They are the more formidable owing to the uncertainty of killing them outright, however great both skill and nerve may be. A bullet aimed at the body very seldom wounds mortally, while one fired from a first-rate rifle fails to penetrate the skull unless it hit the brain-pan, which is small in comparison with the size of the whole head. Under these circumstances it may easily be understood how impossible it is, even at close quarters, to depend upon the sureness of your aim, and how doubtful must be the issue of the contest with this giant of the Tibetan deserts. The only security of the sportsman is in the stupidity and indecision of the yak, which, despite its ferocity, shows an unconquerable fear in the presence of a daring man. Were it not for this, the yak would be a more formidable foe than a tiger, because, as I said before, it is quite in exceptional instances that you can be sure of giving him his death-blow. Your best chance lies in the number of wounds you can inflict, and therefore you must be armed with a breech-loader. Of course I am now merely referring to old bulls; the cows and herds retreat precipitately as soon as the first shot is fired. But old bulls will not always attack the hunter, and often take to their heels even though wounded. In such a case let loose your dogs after them; they will very soon overtake a yak, seize hold of his tail and bring him to bay, and, in his fury, he will assail first one dog then another without noticing you.

It is easier and less dangerous for a mounted sportsman to follow the yak, whether single or in a herd; a good horse will soon come up with the unwieldy brutes. Unfortunately, both our steeds were so starved that they could hardly move their legs, and consequently we never once had an opportunity of yak-hunting on horseback.

But even on foot it was fine sport! Armed with our breech-loaders, my companion and I would start from our yurta early in the morning in pursuit of the game. The huge beasts might easily be seen through a field-glass, more than a mile off, but one is very liable to take lumps of rock for so many yaks *couchant*. They were so plentiful on the Baian-kara-ula and on the banks of the Murui-ussu that we could generally see them grazing within a short distance of our camp.

They are more easily stalked than any other wild animal we know, and so defective are their sight and hearing that you may get within 300 paces of them in the open without difficulty; and single bulls (but not herds) will allow the sportsman to approach nearer still, even though they have noticed him in the distance. Never having been hunted, and confident in their own strength, they show no signs of fear at the approach of a man, but look him steadily in the face, lashing their sides with their bushy tails, or curving them over their backs, to express their anger at being disturbed.

If the hunter continue to advance the yak retires, stopping every now and then to look round in the direction of its pursuer, but when once alarmed by the report of a gun, or wounded, they will run for hours without stopping.

You may occasionally get within fifty paces of them in the mountains by going against the wind; in the open I usually stalked them in the following way. When within three hundred paces I would drop on my knees and raise my rifle above my head with the stand inverted, so that the legs might look like horns; my costume, too, a Siberian shooting coat made of young reindeer skin with the hair outside, helped to deceive the short-sighted animal. In this way I would crawl up to within 200 or even 150 yards, prop my rifle on its rest, place some cartridges in my cap which I laid on the ground beside me, and fire in a kneeling posture. If the first shot took effect the animal would turn and go off, followed by my bullets until it was out of range. An old bull, however, would often charge with horns lowered and tail up, but in a stupid indecisive manner, advancing a few paces, and then stopping and lashing its tail furiously; a second shot, and it would renew the charge with a similar result, until after being pierced by perhaps a dozen bullets, when it would fall dead, without having come nearer than 100 paces. Sometimes after being hit twice or thrice it would take to flight, but on receiving another wound it would turn and again offer a fair mark for my rifle. Of all the yaks we killed, only two advanced to within 40 paces of us, and these would probably have come to closer quarters had we not killed them. I should think, however, that the nearer they are to the sportsman the more cowardly and undecided they become.

In order to give my readers a better notion of yak-shooting I will describe how we shot one of those whose skins are in my collection.[1]

One evening we observed three yaks browsing in a defile not far from our yurta. I went towards them at once, and when within 200 paces aimed at the biggest and fired. All three scampered off,[2] but after running less than half a mile they stopped. This time I approached to about 300 paces, and fired again at the same animal as before. His companions bolted, but the huge beast, wounded for the second time, came slowly towards me. I carried my Berdan breechloader, from which I fired shot after shot, apparently producing no more effect on him than if I had been firing at a target. I could see the dust fly off his coat as the bullets struck him, nevertheless he still advanced, only now and then, as he received a more serious wound, recoiling a few paces. When he got within about 150 paces of the place where I stood, my ammunition was spent, so, leaving one cartridge in my gun in case of emergency, I ran back to camp for a fresh supply, as fast as my legs would carry me. My companion and one of the Cossacks now joined me, and we all three proceeded to the spot where I had left the yak. Here we found him prostrate on the ground, giving no signs of life except by the movement of his head, adorned with a splendid pair of horns.

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[1] We brought home with us two bull-yak skins. Each, when dried, weighed with the horns nearly 2½ cwt. ; the raw hide, which is half an inch thick on the head and neck, weighs with the horns upwards of 3 cwt. 24 lbs.

[2] When in company the wild yak seldom charges.

It had now become dusk, and we could not see to aim. We fired a volley at one hundred yards; in a moment he was on his feet and charging us. We now continued to pepper him from all three rifles, but none the less did he still come on. A second volley, and he flourished his tail in the air and was off; not far, however, for after running 100 paces he stopped. It was now so dark that I determined to waste no more ammunition, feeling confident that he would succumb from his wounds during the night. The following morning, true enough, there he lay quite dead. We counted thirteen bullets in his body and three in his head, one having fractured the skull, which was covered with an integument half an inch thick. On another occasion I was clambering over the mountains when I suddenly caught sight of three yaks lying down; they had not observed me as I was concealed by a rock. I immediately took deliberate aim and fired. All three jumped up and seemed at a loss to know what was the matter; my second bullet killed the one I had first fired at outright. His two companions remained beside him, as usual swishing their tails. My third shot was equally successful in breaking the leg of a second, compelling him to remain stationary. I now directed my fire at the last of the trio, but he was not to be despatched so easily. After the first shot he charged, but after advancing only ten paces in my direction, began to waver. A second bullet caused him to renew the charge, and seventh shot. I now had no difficulty in finishing the one with the broken leg, and thus secured three of these huge beasts in a few minutes without stirring from my place. On examining the slain animals more closely, I found that all seven bullets fired at the one which charged had lodged in his chest, and stuck there like a row of buttons. Knowing with what force a rifle will project a bullet at nearly point-blank range, I was amazed at the prodigious strength displayed by this animal in resisting seven such tremendous blows.

After great experience in yak-shooting I am convinced that one cannot do better than aim behind the shoulder of the left side if possible, for the bullet will go right through and lodge underneath the skin of the opposite side after touching some vital part. But a rifle bullet of small calibre, such as the Berdan, even if it touch the heart, does not of necessity instantaneously kill an old bull, who will often run for several minutes after receiving such a wound. If you aim at the head you are never certain of killing even at short ranges, and if your bullet strike obliquely, although of larger calibre,[1] it will not penetrate the skull. It was always my intention that, if I should ever be hard pressed by one of these animals, I would cripple him by firing at the legs.

Cows and young bulls are also exceedingly difficult to kill for another reason, viz. that they are always in troops, and you cannot single one out of the herd to fire at several times. They are also more wary and difficult to stalk than solitary bulls. Out of a total of thirty-two yaks, shot by my companion and myself during our expedition in Tibet, only three were cows. The Mongols are terribly afraid of the wild yak, and we were told that if a caravan chance to come upon one lying down in a narrow defile, they will halt and not venture to continue their journey till the animal has risen. The Mongols of Tsaidam, however, often hunt the wild yak, their chief inducement being the large quantity of meat which it yields; gluttony overcoming their fears. The hunters, in parties of ten, proceed to the haunts of this animal beyond the Shuga river; afraid to attack him in the open, they get behind some ambush and deliver a volley, concealing themselves till the result of their fire has been ascertained. The wounded beast, after looking in vain for the aggressor, makes off, followed by the hunters at a respectful distance, and if severely wounded the next day he will be found dead. Of course it rarely happens that a yak is killed on the spot by a bullet fired from one of their wretched matchlocks. It sometimes happens that after being wounded in the way we have described, the infuriated beast encounters the horses of his pursuers, and gores them terribly with his formidable horns. Besides eating the yak beef, Mongols use the heart and blood of this animal, taken internally, for medicinal purposes; the hides are sent to Tonkir, and ropes are spun from the long hair of the tail and flanks.

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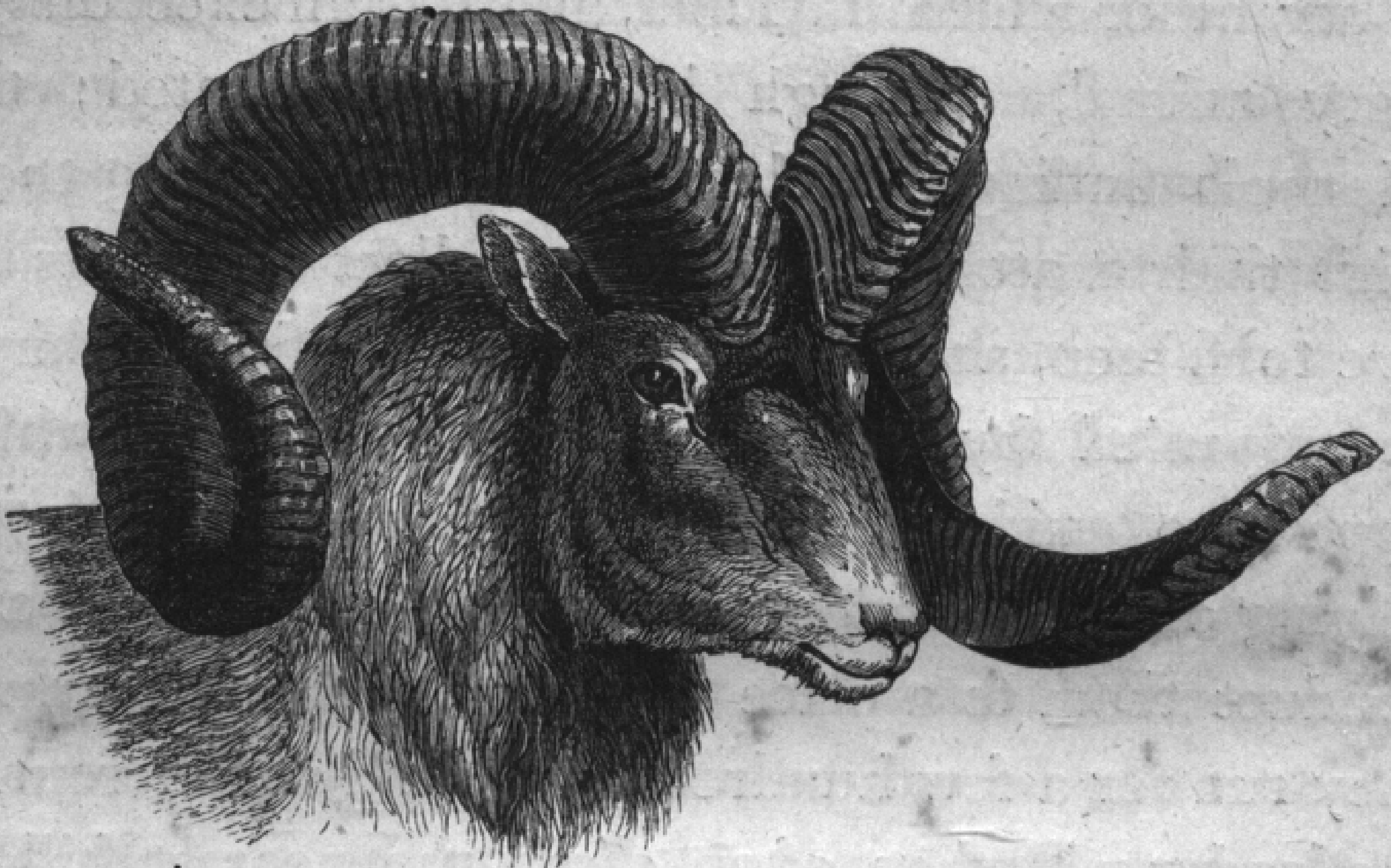
[1] I had a Lancaster rifle which carried a bullet of No. 16 calibre.

A young fat bull or a heifer is excellent eating, though inferior to the domesticated breed (*sarlok*); but the flesh of old bulls is intolerably tough.

We left the greater number of those we shot untouched, having no use for the meat in Tibet. The carcasses soon froze into a solid mass, the tough hide resisting the vultures and wolves. On our way back from the Blue River we saw them lying exactly as we had left them.

Another remarkable animal of Northern Tibet is the *white breasted argali* (*Ovis Poli* ?), of equal size with its Mongolian congener, but differing from it in the horns, and in the white breast, which has a frill of long hairs. We first saw these sheep beyond the Burkhan Buddha, and afterwards as we penetrated farther into the country, but they are not common. The Mongols assured us that they are to be found in the South Koko-nor range, and in the Kan-su mountains near the sources of the



OVIS POLI after an engraving in Severtsoff's 'Turkestanskiya Jivotniya').

Etsina, but we could not discover if this were precisely the same breed. My impression, however, is that it is the same, and that the Tibetan species is also a native of Kan-su and Koko-nor.

Its habits are similar to those of the Mongolian argali. It is generally found in the more elevated plateaux, avoiding the steep and rugged mountains, and keeping to the outer slopes and hills; in Northern Tibet it may frequently be seen pasturing along with kulans and antelope in the ravines.

The senses of the *argali* are keener than those of any other animal in Tibet, and it is an exceedingly wary animal, although hardly ever hunted; the Mongols finding it useless to attempt shooting them with their matchlocks. They collect in flocks of five to fifteen, and occasionally twenty-five to thirty, accompanied by one, two, or three rams, which appear to guide and protect the ewes; the latter relying on their leaders to warn them of danger and conduct them to a place of safety. When alarmed they run for a few hundred yards and wheel round; the leader will then often climb the nearest hill or rock, in order to reconnoitre the surrounding country.. In this position the ram forms a fine picture, his graceful figure standing well out from the rocks, and his snow-white breast glistening in the sun.

I often asked myself which was the finer beast of the two, the yak or the argali; and the best answer I could make was, that each of these animals was perfect in its way. The mighty size of the yak, his ponderous horns and long fringe of hair almost touching the ground, his bushy tail and jet black colour, render him a magnificent specimen of the brute creation! On the other hand, the gracefulness of the argali, his great curving horns, snowy breast, and proud bearing, entitled him to rank among the noblest of creatures in these deserts. In the early morning the argalis graze on the mountains, or in the valleys, but no sooner is the sun up than they seek some spot for repose, sequestered, yet commanding a view all round. Here they scrape a convenient resting place for themselves in the clay, and lie down for several hours. When a flock is reposing in this way, the rams station themselves a little to one side and keep watch; a herd consisting entirely of rams lies close together, their heads turned outwards in different directions. Indeed they are ever vigilant and wary, and the hunter who would approach them must note the direction of the wind and stalk them very carefully. Even with the utmost caution a great deal will still depend on the accuracy of his aim and the trueness of his rifle; for under the most favourable circumstances he cannot expect to get within 200 paces. In all our shooting excursions in Tibet we only killed eight argalis, of which three were full-grown rams.

The Mongols told us that the breeding season was late in the autumn. When we arrived in Tibet in the beginning of December it was over, and the rams were behaving peaceably, but while it lasts they have furious fights, traces of which may be seen in the numbers of broken horns strewn about in all directions. According to the same authority the ewes drop their young in June,[1] and the horns of old rams curve so much downwards and forwards as to prevent them from feeding, and thus sometimes cause their death by starvation. I will not vouch for the truth of this statement, and can only say that in Northern Tibet I rarely saw one of their skulls.

Another characteristic animal of the Tibetan highlands is the antelope, called by the Mongols and Tangutans *orongo* (*Antilope Hodgsoni*). The male is remarkably handsome; in size no bigger than a dzeren, with a beautifully shaped body set on long, slender legs, and with elegant black horns (twenty-three inches long) standing vertically above the head, slightly curved, and annulated on the anterior surface. In winter the hair on the upper part and sides of the muzzle, the sides of the breast, and fore parts of the legs are black, the neck, middle of the breast, stomach, and rump white, the back dun-coloured.[2] When seen at a distance it appears white. The female is much smaller than the male, and has no horns or black marks on the body. We first saw the orongo after crossing the Burkhan Buddha range, beyond which it is distributed towards the south as far as the Tang-la mountains. It loves the valleys and rolling plains, and, after the yak, is the most numerous of the animals of Northern Tibet. Like the kulan and the yak it requires water, and

[1] The argali of Mongolia breeds in August, and the young are dropped in March.

In summer its hair is said to be of a reddish colour like that of selects those parts of the desert where rivers and springs abound.

It is found in small herds from five to twenty, or forty head, rarely collecting in large troops of several hundred, and this only where the pasturage is good and plentiful. Though a few of the old bucks, usually accompanying every herd, are more cautious and experienced, the orongos generally are not wary in their habits. In their flight the males follow the herd as though to prevent straggling; whilst with the dzerens and kara-sultas this order is reversed. When in motion, either leisurely or at full speed, the orongo holds its horns erect, which adds greatly to its appearance. When trotting—its usual pace—the legs move so quickly that at a distance they are invisible, and dogs or wolves are soon left behind.

We arrived in Tibet during the breeding season of these animals, which begins late in November and lasts a month. At this time the full-grown males[1] are in a most excited state, taking little food and soon losing the fat which they had gained during summer. The buck soon forms his harem of ten to twenty wives, and these he jealously guards lest any of them should fall into the power of a rival. No sooner does he see an adversary approaching than he, the lawful lord of the herd, rushes to the encounter with head lowered, uttering short deep bleats. The combat is fierce, and the long sharp horns inflict terrible wounds, often causing the death of both antagonists. Should one feel his strength ebbing, he takes to flight pursued by his enemy, then suddenly wheeling round receives the latter on his horns. As a proof of the fury with which they fight, I remember shooting one of the combatants, who to my surprise continued the fight for several minutes after he had received his death-wound, and then suddenly expired. If a doe chance to stray from the herd, the buck immediately gives chase, and, bleating as he goes, tries to drive her back again. While his attention is thus engaged the others give him the slip, and pursuing first one, then another, he often loses his whole harem. At last, deserted by all, he gives vent to his fury and disgust by striking the ground with his hoofs, curving his tail, lowering his horns and bleating defiance at his compeers. From morning until evening these scenes are constantly occurring, and there appears to be no bond of union between the male antelope and his does; to-day they consort with one buck, to-morrow with another.

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[1] The young bucks, with small horns, and in colour exactly resembling the does, appear not to take part in this internecine warfare, but hold themselves aloof in separate herds with the does, during the rutting season.

The rutting season over, the orongos again live peaceably with one another; the males and females often collecting in separate herds. We saw a troop of about 300 does in February in the valley of the Shuga; the young are dropped in July.

The orongo is fearless and will let the hunter openly approach within 300 yards, or even nearer. The report of fire-arms or the whistle of a bullet does not alarm it; it only shows surprise by walking quietly away, frequently stopping to look at the hunter. Like other antelope it is extremely tenacious of life and will run a long way although wounded.[1]

They are not difficult to shoot, for besides showing no fear they haunt rocky defiles in the mountains, where they may be easily stalked. I have fired as many as one to two hundred shots at them in the course of the day, my bag of course varying a good deal with my luck in the long shots.

The orongo is held sacred by Mongols and Tangutans, and lamas will not touch the meat, which by the way is excellent, particularly in autumn when the animal is fat. The blood is said to possess medicinal virtues, and the horns are used in charlatanism: Mongols tell fortunes and predict future events by the rings on these, and they also serve to mark out the burial places, or more commonly the circles within which the bodies of deceased lamas are exposed: these horns are carried away in large numbers by pilgrims returning from Tibet, and are sold at high prices. Mongols tell you that a whip-handle made from one will in the hands of the rider prevent his steed from tiring.

Another prevalent superstition is, that the orongo has only one horn growing vertically from the centre of the head. In Kan-su and Koko-nor we were told that unicorns were rare, one or two in a thousand;

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[1] In all the orongo killed by us, we found under the skin of the posterior a number of the larvæ of the gadfly, which we found on no other animal of Northern Tibet.

but the Mongols in Tsaidam, who are perfectly well acquainted with the orongo, deny entirely the existence there of a one-horned antelope, though admitting that it might be found in South-western Tibet. Had we gone farther we should probably have heard that it was only to be found in India, and so on till we arrived at the one-horned rhinoceros!

Another antelope native to Northern Tibet, and called by the Mongols *ata-dzeren*, i.e. little antelope (*Antilope picticauda*), is remarkable for its diminutive size. The male is three feet four inches long (including the bend of the neck), two feet four inches high, and only weighs thirty-six pounds; the horns are long and slightly curved, with the points turned backwards, and numerous small notches in front. The prevailing colour is a dusky grey, the rump and belly white, bordered behind and on the flanks by a narrow yellow stripe. We saw this animal near the head waters of the Tatung-gol, and apparently the same species on ascending the high lands of Kan-su in the uneven plain beyond the border range.[1]

Like the orongo it frequents elevated plains, preferring, however, the valleys in the mountains where water is abundant. Yet its habits are very different from the orongo's, and it is without exception the most graceful and the swiftest of the antelopes of Mongolia and Northern Tibet. It generally moves in small herds of five or seven (seldom as many as twenty), though solitary males are often seen. It is extremely wary, specially in those districts where it has learnt to fear man; on the banks of the Murui-ussu it is a little less timid. Its swiftness is amazing; it bounds along like an india-rubber ball, and when startled seems absolutely to fly.

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[1] These are never found in Koko-nor and Tsaidam.

During their breeding season, which begins towards the close of December and lasts a month, the males chase one another from their herds, but we never saw them fighting like the orongo, nor did we ever hear them utter any sound other than a snort (like that of the kara-sulta) on seeing a man; and the does when startled give a short loud cry very similar to that of the young pygarg. They scrape themselves trenches a foot deep, in which they lie at night (and probably during the day), and in these we found heaps of their droppings.

This little antelope is more difficult to shoot than the orongo, besides being much scarcer and extremely tenacious of life. Its ashy-grey colour, exactly resembling the soil, renders it almost invisible at a distance, and it is only by its conspicuous white rump, and its snort, that you may discover its presence. By twilight it sees badly, and suffers the hunter to approach quite close. In conclusion, we may remark that both species are swift runners over smooth ice.

The only beasts of prey that we saw in Northern Tibet were wolves and steppe-foxes, both in great numbers.

The Tibetan wolf (*Lupus Chanco*) is about the size of the common wolf (from which it only differs in its yellowish-white colour),[1] and is most probably identical with the species we heard the Mongols in Kan-su call *tsobr*; but whereas it is rare in the latter country, in Northern Tibet it is very common, of course owing to the unpeopled nature of this country and the abundance of animals upon which it can prey. Here it ranges over the plains in large packs, and attacks the yak, the orongo, and the rest. Tibetan wolves are savage and impudent, but are more cowardly and less powerful than the grey species. Our dogs fought with them, and drove them away every night. They frequently attempted, in their nocturnal visits to our yurta, to carry off things by stealth; we could leave no dead game exposed (except yak) without its being instantly gnawed or devoured by these ravenous brutes. My companion on one occasion shot four orongo about two miles from camp, whither he went for assistance, and on returning with a camel to bring them in, found that they had been devoured in his absence.

At one place in the valley of the Shuga we made a *cache* among some loose rocks, hiding our butter there; but these horrid brutes scented it, turned up the heavy stones and devoured the store we had prepared for our return journey, actually swallowing the woollen cloth in which it was wrapped! On another occasion I left my fowling-piece in the mountains with some prepared tin cartridge cases; the following day on going to fetch it, I could find neither gun nor cartridges, which had been dragged away by these wolves; the gun was lying a little distance off with one barrel exploded, the trigger having evidently struck against a rock as they hauled it along; the cartridges were completely gone. Yet with all his impudence this wolf is so wary that he will never allow a man to come near him during the day, and recourse must be had to artifice to kill him; for such is his tenacity of life, that unless shot through a vital part he will escape. We lost a great deal of time in trying to secure one of their skins, and at last I succeeded in killing one by lying in ambush behind the carcase of a kulan.

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[1] There are no grey wolves in Tibet, although plentiful in Tsaidam.

We tried watching at night by the side of a slain yak, but although we wounded several, they always managed to get away. In Northern Tibet, had we possessed strychnine or traps, we might have killed any number of them.

Their breeding season is January, when they are never more than ten or fifteen in a pack. They utter a short sharp bark like a dog.

The fox is rare in Northern Tibet, but the closely-allied steppe-fox (*Canis Corsac*), called by the Mongols *kiarsa*, is more common.

This sagacious animal is distributed over the whole of Mongolia, Kan-su, Koko-nor, and Tsaidam, but is most numerous on the plains round Koko-nor, where it finds an abundance of marmots,—its chief food.

Owing to its excessive wariness I was unable to study its habits. On seeing a man a long way off, it disappears instantaneously, either by taking to flight or by crouching on the ground, a manœuvre frequently practised during the breeding season, which lasts from the end of January to the end of February. During this time their hideous cry may be heard night and morning, closely resembling the hooting of an owl. The corsac lives in burrows of its own construction. The Mongols and Tangutans catch it by setting traps at the entrances of these holes.

Turning from the mammalia of Northern Tibet to the birds, we find a general deficiency of the latter. It was, to be sure, mid-winter when we were there, and the summer birds had all flown away ; but at the best of times no great variety can be expected in this country, so variable and unfavourable are its physical conditions. During our two and a half months' stay here we saw but twenty-nine kinds, only one of which (*Cinclus* sp.) was new ; the others we had seen in Kan-su and Koko-nor. The few we saw in Northern Tibet were mostly on the border, north of the Shuga, and between this river and the Murui-ussu they were very scarce.

The most common birds of Northern Tibet are: vultures (*Vultur monachus, Gyps nivicola*), lammergeiers (*Gypaëtos barbatus*), and crows (*Corvus corax*), all which appear as soon as an animal is slain ; red-legged crows (*Fregilus graculus*), which collect in vast flocks during winter ; sandgrouse (*Syrrhaptes Tibetanus*), larks (*Melanocorypha maxima, Alauda albigula*), linnets (*Linota brevirostra*), the last named probably only wintering here ; also the *Podoces hu-*

milis and the *Montifringilla* (sp.) so numerous in Koko-nor.

After this long digression on the fauna of Northern Tibet, I resume my narrative.

As I mentioned in the last chapter, we hired a guide in Tsaidam, and, accompanied by him, started for the Burkhan Buddha. In order to lighten as much as possible the loads of our camels, which carry with great difficulty the smallest pack over these enormous elevations, we left some of our supplies of barley-meal and flour in Tsaidam, and buried our spare ammunition under some stones near the summit of the Burkhan Buddha pass. Notwithstanding this our packs, filled as they were with skins of animals, were quite heavy enough, and we were compelled to bury in the sand two yak skins obtained for our collection, only taking them with us on our way back.

These two months and a half[1] in Northern Tibet were the most arduous of the whole of the expedition. Winter had set in with severe frosts and storms, and the want of even the bare necessaries of life, with other privations, reduced our strength; so that it became a hard struggle for life, and nothing but a consciousness of the scientific importance of our labours inspired us with strength and energy to carry out the task we had undertaken.

For better protection against the cold we took the yurta given us by the uncle of the Prince of Koko-nor; and if it gave us a great deal of additional trouble, what with pitching, taking to pieces and packing, still it was a far better shelter against storms and cold than the ordinary tent.

Its dimensions were these: diameter, 11 feet; height from the ground to the aperture in the roof, 9 feet; the entrance was by an opening in the side, 3 feet square, through which we crept in and out; the sides and roof were covered with three layers of felt, besides which we lined the sides with orongo skins.

The interior did not admit of much comfort: here stood two boxes (containing journals, instruments, &c.) besides felts for sleeping upon, whilst our arms were ranged round the sides, and an iron grate stood in the centre, in which argols were continually burning during the day, to cook our food and afford us some warmth. Towards evening, and particularly after undressing for the night, sundry articles of apparel might be seen suspended from the lattice woodwork of the sides, and from the rafters supporting the roof.

Such was our home during the whole of our arduous winter journey in Tibet. Two hours before daybreak every morning we rose, lighted the argols, and boiled our brick-tea, which, mixed with some barley-meal, served for our breakfast; sometimes for a change we baked either *zaturan*[1] or wheaten cakes in the hot argol ashes. As soon as the day dawned

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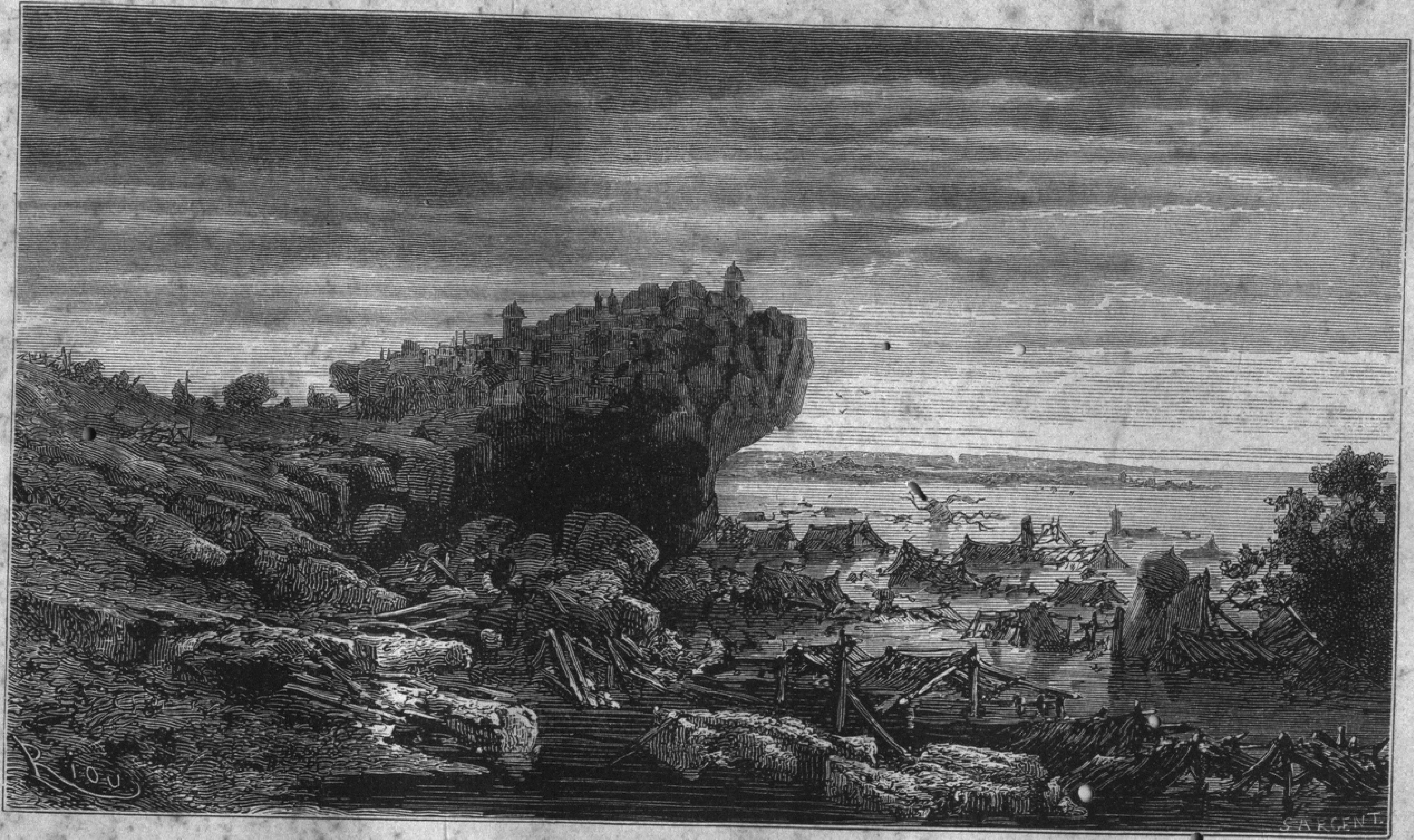
[1] '*Zaturan*' is a favourite dish of the Cossacks of Trans-Baikalia and the Amur country. It consist of brick-tea, into which flour baked with butter and salt is added, the mess tasting much like soap.


RIOU
SARGENT.

VILLAGE ON THE SHORE OF LAKE BAIKAL (EASTERN SIBERIA) DESTROYED BY AN EARTHQUAKE.

we made preparations for the march, by taking the yurta to pieces and packing it with the other baggage on the camels. All this occupied a good hour and a half, so that by the time we were ready to start we already felt tired. Sometimes it was so cold, and the wind was so keen, that we could not sit on horseback, yet the exertion of walking, encumbered as we were with some eighteen pounds' weight in the shape of gun and ammunition, was often too much for our strength at that terrible elevation, where every additional pound told, and we constantly suffered from those distressing symptoms caused by the extreme rarefaction of the atmosphere.

Our warm clothing, too, was so worn out by two years' use as to be a most ineffectual protection against the cold; our fur coats and trowsers being in tatters. As for boots we had none, and were reduced to sewing bits of yak-hide to old leggings, as a covering for our feet in the coldest weather.

Frequently, towards midday, the wind would increase to the violence of a hurricane, filling the air with sand and dust, and making further progress impossible while it lasted; and we would be compelled to halt, although we had gone only six or seven miles. But even in the finest weather a march of twelve miles on those lofty plains is more exhausting to the strength than double that distance at a lower elevation.

On arriving at the halting place our first duty was to unload the camels and set up the yurta, which took us another hour; the next was to collect argols, break ice for water, and then we had to wait, hungry and tired, till the water boiled. How we used to relish the nasty compound of butter and barley-meal, glad enough even to get that!

After this meal my companion and I would start off on a shooting expedition, weather of course permitting, or I would write up my diary while the Cossacks cooked the dinner. Now the axe was again required to break the ice and chop the frozen meat before putting them into the pot, whilst that again had to be tinkered with raw hide and barley-meal paste. This utensil, which served the double purpose of saucepan and tea-kettle, had, from constant use, worn into holes, and these had to be mended every day. It was not till afterwards that we succeeded in patching it more effectually with the copper cartridge cases of our Berdan rifle.

Dinner was ready at six or seven P.M., and was a sumptuous repast, for we had now enough meat and to spare; indeed we might have supplied a regiment with the game we killed. Unfortunately, it was often frozen so hard that we could scarcely thaw enough for our soup. Moreover, the argols burnt so badly and gave out so little heat at this great elevation, and water boiled at such a low temperature (185° Fahr.),[1] that it was difficult to cook the meat properly.

After this meal, which was dinner and supper combined, we had more work to do: the marshes and streams being all, with a few exceptions, ice to the bottom, we had every day to melt two buckets full of water for our horses. Then followed the most tedious time of all, the long winter's night! One would have supposed that after the day's work we should have passed it quietly and slept soundly; but this was far from being the case. Our fatigue was of a more than ordinary kind, and we felt a prostration of the whole system which seemed to render sound sleep impossible. The dry rarefied air produced a choking sensation like a heavy nightmare, and our lips and mouths became parched. Our beds consisted of pieces of dusty felt of a single fold, laid on the frozen ground; on these we lay for ten consecutive hours, but unable to enjoy a really good night's rest, and so to forget for a time the hardships which encompassed us.

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[1] The boiling point of water at sea-level is 212° Fahr.—M.

The days devoted to sport passed more pleasantly, but cold and wind often interfered with our shooting excursions, and sometimes quite put a stop to them. The wind blew every day, and even if not always with the force of a gale it was always sufficient to impede our movements; for, to say nothing of the cold, which obliged us to don ear-protectors, warm gloves, and fur coats, to face the wind[1] would fill our eyes with tears, thus seriously affecting the rapidity and accuracy of our fire. Our hands, too, became so benumbed that we had to rub them before placing a cartridge in the chamber of a breechloader, and the metal contracted so that we had to use ramrods to get the empty cartridge cases out of the Snider rifle. With the Berdan this never occurred, but its locks were injured by the cold and dust, and the cartridge often missed fire, only going off after a second blow of the hammer.

The climate of Northern Tibet during December and January is marked by the prevalence of severe frost, dearth of snow, and dust-storms.

Although in more southern latitudes than the warmest parts of Europe, we were often reminded here of the extreme north. At night the thermometer descended to — 24° Fahr.,[1] occasionally when it was cloudy rising to 10° Fahr. However, as soon as the sun was high up in the heavens the mercury rapidly rose, and on four days stood above freezing point (or 32° Fahr.) at midday.

But little snow fell,[2] and what there was in fine flakes, and as dry as dust; occasionally covering the surface an inch deep, but only for a short time, and vanishing with the next gale, when it became mixed up with the sand, and melted by the sun. It seldom happens during winter that these deserts are quite white,[3] and even on the summits of high mountains the snow only lies in small patches on the northern slopes. The dust-storms which were so frequent invariably came from the west or north-west, and always occurred in the daytime. They would begin with a moderate gale, gradually increasing in violence until midday, when they would continue to rage like a hurricane till sunset. By degrees the sky assumed a dust colour, growing thicker and thicker until the sun shone dimly, and at length was quite obscured from sight. Sand and small stones were carried through the air like hail or snow. We could neither open our eyes in the face of the wind, nor draw breath, and so charged was the air with fine dust that it could hardly pass into the lungs, and camels let loose to-graze would forget their hunger and throw themselves on the ground.

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[1] And probably even lower, for we had no minimum thermometer, ours being broken, so we took the night temperature at sunrise.

[2] In December snow fell on four days, in January on eleven.

[3] It is said that in some years a large quantity of snow falls. However, this can hardly be the case, because if so, all the herbivorous

But while the storm lasted, the thermometer rose to 32° Fahr., or even higher, a phenomenon which may be explained by the rapid passage through the air of the sand and dust previously warmed by the sun. Towards sunset it suddenly became calm, the dust remaining suspended in the atmosphere, often till the following morning, when a light wind had been stirring during the night.

Our travelling companion and guide in Northern Tibet was a Mongol, by name Chutun-dzamba; he was a *zanghin*, or officer of low grade, fifty-eight years of age, and had been nine times to Lhassa with caravans, so that he was well acquainted with the road. He was one of the most intelligent men in Tsaidam, and gave us a good deal of information on the countries through which we were travelling; and he would probably have imparted more if our interpreter had been better up to his work.

Like all Mongols, he was a dreadful hypocrite, [illegible] a degree. Once on his camel he would *never cease* muttering his prayers through the march, and would not dismount to walk for any consideration, even in the coldest weather, or on the steep descents and in other dangerous places, where it would have been safer to have tried the strength of the ice. A casual observer might have taken him for a plucky fellow, but the fact was that his excessive laziness overcame his fear.

Chutun-dzamba, however, took good care of himself, and laid in a supply of medicines for the road, with which he doctored himself daily for some imaginary complaint. He was really ill several times, but this was entirely owing to the extraordinary quantity of meat he had eaten. During dinner he ranged round him plates of frozen yak-dung, on which he placed junks of hot meat to cool, and which, as these melted, adhered to the meat, and must truly have added a fine flavour to his viands, judging from the relish with which he ate! His behaviour after dinner was equally indelicate, and in the evenings he employed himself industriously in the destruction of the parasitical insects which swarmed in his habiliments.

Another trait in his character was the passion he had for picking up and hiding in his bag all sorts of odds and ends and rubbish which we had thrown away. Thus, an old bit of leather or tin, a spoilt steel nib, a scrap of paper, empty cartridge cases, all would find their way into his travelling bag, and at last we were obliged to throw anything away by stealth, to avoid its attracting the attention of this monomaniac.

After passing the low Baian-kara-ula[1] range, at length, on January 22, 1873, we reached the banks of the Yangtse-kiang or Blue River, called by the Mongols in its upper course the Murui-ussu, and by the Tangutans Di-chu.[2] This river rises in the Tang-la mountains, and after passing through the highlands of Northern Tibet, pursues its course to the boundaries of China Proper, where it soon swells into a mighty stream.[3] The current of the Murui-ussu is extremely rapid, and the width of its channel at the spot where we saw it, i.e. at its confluence with the Napchitai-ulan-muren, is 750 feet; but the whole river-bed from bank to bank is upwards of a mile wide and, as our guide assured us, is entirely covered with water during the rainy season in summer, when it sometimes even overflows the banks. In autumn, after the floods have subsided, the Murui-ussu is fordable, but only in a few places.[4]

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[1] The pass over the Baian-kara-ula is very gradual and not high; it may even be entirely avoided by following the valley of the Napchitai-ulan-muren, as we did; Huc, however, describes it as an enormous range, dreadfully difficult to cross. The père declares that in certain places he was obliged to hold on to the tail of his horse and drive it before him up the steep incline.—*Souvenirs d'un Voyage, &c.*, ii. 216–218.

[2] The latter name signifies 'cows' river,' probably from the abundance of wild yak. The translation of the Mongol name is 'river-water,' 'mur' being an abbreviation of 'muren,' i.e. river, and 'ussu' meaning water. [I should greatly doubt this bit of etymology.—Y.]

[3] See Supplemetary Note.

[4] The first ford, in ascending the river from the confluence of the Napchitai-ulan-muren, is 20 miles distant

The breadth of the valley is less than a mile and a half, and in some places the mountains on either side narrow it even more. The Tibetan road ascends the river for a ten days' march to its sources in the Tang-la mountains.[1] Here, too, there is no population, with the exception of 500 Tangutans, who are encamped about 100 miles above the mouth of the Napchitai-ulan-muren. About 230 miles lower down there is a large agricultural population, and the climate is said to be warmer, so that probably the elevation of the country is not so great in those parts.

The banks of the Blue River were the limit of our wanderings in Inner Asia. Although we were only twenty-seven days' journey, i.e. about 500 miles from Lhassa, that goal was beyond our reach. The frightful difficulties of the Tibetan deserts had so completely exhausted our animals that three of our eleven camels had died, and the rest could scarcely move. Our pecuniary resources, too, were entirely expended, and after exchanging some camels for the return journey to Tsaidam, we had only five lans (27*s.* 6*d.*) left, with many hundred miles of road before us! Under these circumstances, we could not imperil the results already obtained by our journey, and we resolved to return to Koko-nor and Kan-su, to pass the spring there, and then to continue our journey to Ala-shan by the road we had come, where we should have no need for a guide.

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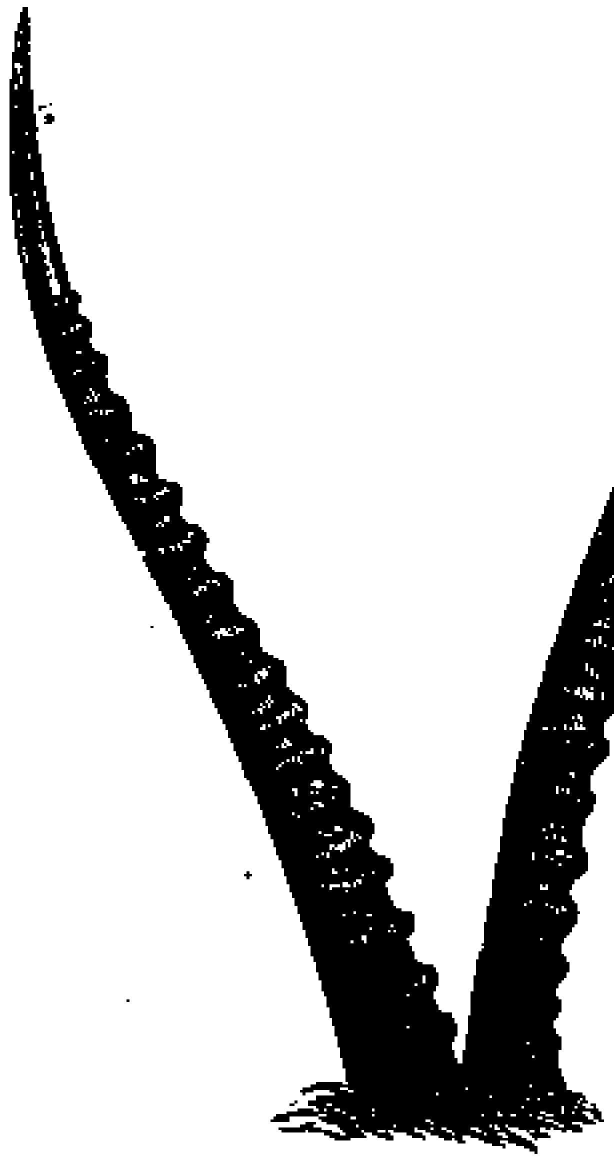
[1] All caravans with camels take this road: there is another more direct road practicable for yaks, without ascending the Murui-ussu, but it crosses many steep and lofty ranges

Although this decision had been formed some time previously, it was not the less with sorrowful hearts that we bade farewell to the banks of the Yangtse-kiang. For well we knew that neither nature nor man stood in our way, and that the want of funds was the only obstacle to our reaching the capital of Tibet.



Horns of the Orongo-Antelope

CHAPTER VII.

SPRING ON LAKE KOKO-NOR AND AMONG THE KAN-SU MOUNTAINS.

Return to Tsaidam—Influence of its warmer climate—Spring in Tsaidam—Migratory birds—Spring in Koko-nor—Mirages—Shooting excursions—Fishing—Thaw on lake—Scarcity of birds—Departure for Chobsen—Equipment of caravan—Sale of revolvers—Humidity of Kan-su—Slippery mountain paths—Fording the Tatung-gol—Encounter with 'Kotens'—First signs of spring—Night frosts—Gales—Atmospheric phenomena—Tardy vegetation—The great rock-partridge (*hailik*)—The snow-vulture; how to shoot it.—Heavy snowfall—May in Kan-su—The long-eared pheasant (*Crossoptilon auritum*)—The marmot (*Arctomys robustus*)—The bear (*kung-guressu*)—Extraordinary reports concerning it—We see one—It escapes—Straitened finances—Last weeks in Kan-su—Its variable climate—Departure.

About the middle of February our wanderings through Northern Tibet terminated, and we returned to the plains of Tsaidam. The contrast between its climate and that of the lofty plateau of Tibet was so marked that in descending the Burkhan Buddha we felt it grow warmer at every step.

The influence of the warmth of these plains on the neighbouring highlands is apparent as far south as the Shuga range; for we had hardly recrossed this, and commenced the descent of its northern side, when the climate became sensibly milder. Though the night frosts continued with their former intensity (– 18° Fahr.), during the day the sun was powerful, and on the 17th February we saw the first insects on the Tibetan side of the Burkhan Buddha. On our outward journey to the Murui-ussu the weather had been fine, and in the daytime warm, as far as the Shuga range, after crossing which and the Uyan-Karza rivulet, it became very cold and stormy.

Spring in Tsaidam begins early and is of a truly continental character. In the end of February the frosts at night still carried the cold down to — 4° Fahr., whilst in the day the temperature in the shade was 59° Fahr., and the ice began rapidly thawing under the influence of the sun; on the 22d of the month the first to appear among migratory birds was the widgeon, followed on the 25th by the mallard;[1] and the day after the goosander (*Mergus merganser*), the red-breasted thrush (*Turdus ruficollis*), and swans (*Cygnus musicus*) arrived: in the mornings were heard the notes of small birds and the call of the pheasant; in fact, Spring asserted her right to reign.

But all these harbingers of the beneficent season were again suddenly checked by the recurrence of cold weather, accompanied by snow,[2] and by gales of wind, generally from the west, filling the air with clouds of fine dust raised from the salt marshes, which hung like vapour over everything long after the storm had subsided. Frosts and cold winds, too, so materially retarded vegetation that its aspect differed very little at the end of the month from that which it had presented at the beginning. Although by the second week in March thirteen kinds of birds[1] had made their appearance, it was only singly or in small numbers; and how rapid must their flight have been over the terribly cold deserts of Northern Tibet, where they could have procured neither food nor water!

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[1] This duck sometimes winters in Tsaidam in the unfrozen marshes fed by springs.

[2] In the latter end of February snow fell in Tsaidam (in thick flakes, not in dry fine dust as in Tibet) four times, and although covering the ground an inch or two in thickness, soon thawed in the sun.

We arrived on the shores of Lake Koko-nor in the middle of March and found the season as backward as it had been in Tsaidam a month earlier. The lake was entirely frozen over, and even the rapid Pouhain-gol was only here and there free from the ice, which in winter attained a thickness of three feet. Here, too, migratory birds were even less numerous than in Tsaidam. The cause of this difference in the climate of two countries lying in such close proximity to one another is, first, the great elevation of the Koko-nor basin, and, secondly, the influence which the great expanse of its waters exercises over the surrounding country. This sufficiently accounts for the contrast in the climates, which is so marked that it is even noticed by the inhabitants.

We determined to remain by the lake till the end of April to observe the flight of birds; and with this object in view we stationed ourselves at the mouth of the Pouhain-gol, pitching our yurta by a small marsh on the borders of a plain, where our horses and camels could find plenty of good grass, and the latter might feast on *gudjir* and on their favourite tamarisk bushes, which grew in the bed of the river.

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[1] They appeared in the following order: *Anas rutila*, *A. boschas*, *Linota brevirostris*, *Mergus merganser*, *Turdus ruficollis*, *Cygnus musicus*, *Anas crecca*, *Vanellus cristatus*, *Ardea alba*, *Anser cinereus*, *Anas acuta*, *Anthus pratensis*? (occasionally wintering in Tsaidam), and *Grus virgo*.

The lake itself presented a very different aspect from what it had borne the previous autumn. The dark blue waters, now covered with a glittering expanse of ice, lay like a vast mirror in a framework of mountains and plains. Not a broken space was visible, and but little snow was scattered on the frozen level surface, which in places was clear as crystal and reflected the sun's rays, making it look like open water.

The plains surrounding the lake were clothed with yellow withered grass, for the most part trampled under foot by wild asses, antelope, and Tangutan cattle, whilst the monotony of the landscape was only relieved by mirages. These were so frequent and so delusive as to render it impossible to shoot any large animals with the rifle, for the game would appear to float in the air, magnified to twice its natural size.

Having encamped in a spot where there were neither Mongols nor Tangutans to interfere with us, we made daily expeditions along the shores of the lake and the banks of the Pouhain-gol. But, alas! day after day passed without the longed-for arrival of birds. Some there were certainly, but in little variety, and so few in number that we could not always shoot enough for our personal requirements, and hardly any specimens were added to our ornithological collection, the weather continuing cold, snowy,[1] and tempestuous during the latter half of March.

Our fishing was far more successful; for although we only caught one kind, the *Schizopygopsis* (nov. sp.), yet this was in such quantities that on one occasion we actually hauled out with our small thirty-one foot casting net a hundred and thirty-six of them, averaging some two feet in length and nearly three pounds in weight. These, with the birds and antelope that we shot, were our exclusive food at this time. The roe of the fish, however, proved very unwholesome, and after eating it we were all seized with violent sickness, dysentery, and pains in the stomach. Fortunately, the Mongol who was with us had not touched any, and was able to make a fire, at which we prepared hot poultices, taking internally some excellent cholera drops which we found in our medicine chest, and by these means we were all right the following day.

Towards the end of March the weather became less severe, and on the 29th the lower course of the Pouhain-gol was free of ice, the lake still remaining frozen except near the mouths of streams. But the heat of the sun gradually thawed it, and on the 6th April a gale of wind suddenly sprang up and dispersed the ice. On the 7th large open spaces might be seen in all parts of the lake, whilst fragments of ice were piled up on the shore, and on the frozen expanses that still remained unbroken.

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[1] Snow fell seven times in the latter half of March; in the first fortnight in April it neither snowed nor rained once.

The water now rapidly cleared, and in a week it was quite open; the floes having been partly driven by the wind into the bays on the western shore, and partly washed on to land. But night frosts continued with their usual severity, the thermometer registering 11° Fahr., and the temperature falling after sunset as rapidly as it rose on bright still mornings.

The winds, which were almost of daily occurrence, mostly blew from the east and west, the former always moderate and wafting the chilly air of the lake to its western shore, the latter, although from a warm quarter, raged with great fury,[1] bringing clouds of dust.

In the beginning of April migratory birds were extremely scarce. By the 13th of the month, though we had seen thirty-nine kinds (inclusive of those noted in Tsaidam),[2] yet no large flocks of geese, ducks, or other birds had passed over, and the shores of the lake and river were inanimate, without any of those sounds which usually accompany the spring flight of the feathered tribe. The mornings and evenings were almost as still and silent as in midwinter; the call of the widgeon, the cackle of geese, the cry of the sea-gull, or the noise of the duck were indeed rare sounds, and had it not been for the loud notes of the great lark (*Melanocorypha maxima*), the shores of Koko-nor had been indeed voiceless.

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[1] Between the middle of March and the middle of April there were six severe gales, without, however, blowing with such violence as in Tibet, or even in South-eastern Mongolia.

[2] Twenty-six migratory birds appeared in Koko-nor by that date, viz. between March 13th and 22nd: *Accentor rubeculoides*, *Cinclus Cashmiriensis*, *Cygnus olor*, *Fuligula clangula*, *Larus ichthyætos*, *L. ridibundus*, *Anser Indicus*, *Fuligula cristata*, and *Milvus govinda*. Between March 22nd and April 1st: *Phalacrocorax carbo*, *Anas tadorna*, *A. clypeata*, *Numenius* sp., *Fuligula ferina*, *Avocetta recurvirostra*, and *Grus cinerea*. Between April 1st and 13th: *Anas Penelope*, *Limosa melanuroides*? *Totanus calidris*? *Eudromias* sp., *Haliætos Macei*, *Circus rufus*, *Motacilla* sp., *Scolopax gallinago*, *Coturnix muta* and

Spring fell far short of our expectations, and birds were not nearly so numerous as they were on Dalai-nor at the same season, two years ago. In all probability they leave Koko-nor to one side in their flight northwards, keeping to the valley of the Hoang-ho and to China Proper, and avoiding the Kan-su mountains and the deserts of Ala-shan. In proof of this, I may mention that we found many kinds of waterfowl in the northern bend of the Hoang-ho which we never saw at Koko-nor: such as *Anser cygnoides*, *A. segetum*, *Anas falcata*, *Ardea cinerea*, *Fulica atra*, and others.

The dearth of birds induced us to abandon our intention of remaining on the shores of the lake until the end of April; so on the 13th we broke up our camp and marched towards the temple of Chobsen by the same road that we had travelled in autumn. We might have taken the easier route[1] through Tonkir, but having experienced the unpleasantness of journeying through thickly populated districts, we preferred again facing the difficulties of the mountains.

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[1] After the re-capture by the Chinese troops of the towns of Si-ning

During our month's stay on the Pouhain-gol we finally equipped our caravan for the march. We exchanged our felt tent for camel-saddles, of which we stood greatly in need. On returning to Tsaidam half the camels were unfit for work, and although we succeeded in obtaining others in their stead the money we had to pay in addition completely exhausted our finances, leaving us only five lans with which to supply the place of those that had perished in Tibet. We were at length driven to the last extremity of selling revolvers to the Tangutans and Mongol officials, and bartered away three out of our remaining twelve for three good camels, besides selling two for sixty-five lans (18*l.*), which enabled us to remain three spring months in Koko-nor and Kan-su.

The first step we took in Kan-su everything suddenly changed. Instead of a dry atmosphere, we had a fall of snow every day, whilst the ground was saturated with moisture like a sponge. Vegetation had not begun to develope itself under the influence of spring; the watercourses were still covered with ice, and the night frosts were still sharp. There were fewer migratory birds even than at Koko-nor, and summer visitants had not arrived in large numbers; a few solitary specimens only having made their appearance. In fact the Kan-su mountains looked just as we had left them in the end of October of the previous autumn.

The road over the mountains was now more difficult than ever, owing to the slipperiness of the paths after the night frosts; patches of winter snow too lingered on the northern sides of the higher summits.[1] Our loads, increased in weight by the excess of humidity, lay heavier on the camels' backs without the slightest increase of advantage to us, and these animals, from lying on the damp ground at night, began to cough and grow thin. Our unshod horses were continually falling on the slippery paths, so that we ourselves had to go on foot; an exercise for which the make-shift boots we had improvised out of old leggings and yak-hide were no better adapted than the thick-soled feet of the camels. To add to our troubles we had twice to ford the Tatung-gol; the first time over the ice, which had settled to the bottom of the river, and the second time through four feet of water, in a place where the current was rapid, and the channel full of huge boulders. Had one of our camels missed its footing here, it must inevitably have been drowned, with the precious burden of our collections. Besides other work, I had now to survey the route back from the Murui-ussu, having purposely avoided doing so on the outward journey in order not to excite the suspicions of our guides.

Although the mountains were no longer infested by Dungans, we might at any time have a disagreeable encounter with Chinese soldiers; and this actually happened to us at the very place where the Dungans had threatened to attack us the year before. This time it was a party of 'Kotens' that met us on their way from Seng-kwan to the Tatung-gol. We showed the commander of the detachment our Peking passport, but while doing so a soldier stole a revolver from one of our holsters. We protested vigorously against this, and though we could only express our sentiments by pantomimic gestures, the Chinese officer understood their meaning, and, afraid lest we should prefer our complaints at Peking, he gave orders that it should be restored to us. He then asked for gunpowder, and on receiving a dozen charges expressed himself entirely satisfied, and we parted good friends.

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[1] The cause of the small quantity of snow on the Kan-su mountains so early in spring, is that the snowfall in winter is small, and soon thaws in the sun, which on calm, bright days, even in February, is hot.

We reached Chobsen on the 27th April, and after a two days' stay at the temple, started for the mountains in the vicinity of Chertinton, where we had passed the previous summer.

Spring now began in earnest; on the 21st we saw the first butterflies, and on the 23rd the first flower, a species of *Ficaria*. The southern slopes were tinged with green, small birds arrived in numbers, and near Chobsen ploughing and sowing (barley and wheat) had begun, some corn being already visible above ground.

There was a thunderstorm on the 26th April, which, though accompanied by hail, reminded us of the approach of spring, for which we had so long waited. But vegetation advanced slowly owing to constant night frosts (16° Fahr. in the first week of May), and though by the 13th of May twelve kinds of flowers had blossomed, it was generally in very small numbers, by ones and twos under stones and bushes, where they were protected from storms. The wind and snow continued to the second week in May; indeed no rain fell, whilst snow fell on seventeen days. Moreover, the wind blew hard and incessantly by day and night, most frequently from the east or from the west; but it varied much, constantly shifting from one quarter to another, and sometimes coming in violent gusts. While these gales lasted, and for hours afterwards, the air was laden with dust from the neighbouring deserts.

Notwithstanding the abundance of the atmospheric deposits and the humidity of the soil, the watercourses contained less water than in the summer, and many were quite dry; whilst the psychrometer indicated considerable dryness in the air on those days on which it neither snowed nor rained. The first of these phenomena is probably due to the circumstance that the frozen earth imbibed a great deal of the moisture which fell; and the dryness of the atmosphere in clear weather was doubtless caused by the influence of the surrounding barren plains, which were at this time quite parched.

We had no fine spring weather. Occasionally it would clear up at midday, but the wind would again rise, bringing more snow and a lower temperature. The hottest day was the 24th April, when the meryear before, at the same season, the maximum temperature in the valley of the Hoang-ho was 88° Fahr., and even in South-eastern Mongolia, near Kalgan, the thermometer in April 1871 showed 79° Fahr.

From all we have said it will be apparent that spring in Kan-su is as cold and humid as the summer and autumn; in fact the whole year round there is not one entire month of fine weather, such as we are accustomed to in other countries. In spring and autumn snow falls abundantly; the summer is wet; in winter the sky is clear, but the winds are bitter and tempestuous.

On our way from Chobsen to the mountains south of the Tatung-gol we passed the early part of May in the alpine zone, which was quite inanimate. Flocks of small birds had arrived in large numbers early in May, only to rest for awhile on the meadows or near the rocks, whilst the less hurried visitants still kept to the lower and more genial valleys. Vegetation was awakening but tardily, and the *Ficaria* and *Primula* were the only flowers out. Finding them, as we often did, on the alpine meadows beside unmelted snow, we wondered how they could adapt themselves to such unfavourable conditions. I saw primulæ, gentians, and irises uninjured by the frost (8° Fahr.) or the deep snow at night; and no sooner did the sun shine out than these children of spring decked themselves as brilliantly as ever, and appeared to be hastening to enjoy the fleeting moments of warmth before they should be overtaken by the next frost or snowfall.

In the absence of summer birds, those we saw most of in the upper alpine belts, besides jackdaws and wall-climbers, were the great rock-partridge, called by the Tangutans *hailik* (*Megaloperdix Tibetanus*) and the snow-vulture (*Gyps nivicola*).[1] The former is never seen in Mongolia, but is distributed through the highlands of Kan-su, Koko-nor, and Tibet. Its exclusive habitat is among the wild crags and loose rock *débris* at an elevation never below 10,000 feet above the sea; the wilder the cliffs and the more extensive the loose *débris* the better suited are they to the rock-partridge, which is equal in size to the hen capercailzie. It pairs in spring, and during the remainder of the year is found in coveys or small flocks of ten to fifteen, never in large packs.

It is a blithesome bird and may be heard all day long, enlivening the otherwise silent, weird rocks of the alpine zone with its loud note, which resembles the cluck of the hen accompanied by a long whistle and sometimes by short abrupt sounds; but these it generally utters whilst on the wing. But this partridge, like the gallinaceous tribe in general, is not fond of flying. It is so swift a runner that it will elude the pursuit of the sportsman, who is often baffled by the perpendicular descents and the great extent of loose rock. Although rarely hunted by the natives it is nevertheless extremely shy and not easily seen, owing to its grey plumage closely assimilating with the colour of the rocks.

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[1] As we have stated in a note to Chapter III., this vulture is identical with *Gyps Himalayensis*, described by Hume. (See *Rough Notes*, p. 12.) The first specimen of this bird was sent to the zoological museum of the Academy of Arts and Sciences at St. Petersburg, by M. Carelin, from Alatau in the Semirechinsk division of the Russian province of Turkestan; see Severtsoff's *Turkestanskiya Jivotniya*, p. 111.—M.

Early in the morning and towards evening it flies to the grassy knolls where it feeds. I never detected insects in its crop; its favourite food in summer consisting of the heads of wild onions which grow in abundance on the alpine meadows.

There are five to ten chicks in a brood, over which the parent birds watch with anxious solicitude. If danger be near, particularly when the young are very small, the old birds will run about twenty paces from the sportsman and try to attract his attention by feigning lameness or illness, as our partridges will often do at home. Chickless pairs, whose eggs have most likely been destroyed by the frost, are not uncommon, and the probable frequency of these mishaps may account for their comparatively small numbers in the Kan-su mountains and the ranges of Northern Tibet.[1]

Another characteristic bird of the alpine zone of the Kan-su mountains is the snow-vulture (*Gyps nivicola*),[2] resembling in its mode of life and habits other species belonging to the same family, and chiefly remarkable for its powerful flight and gluttony.

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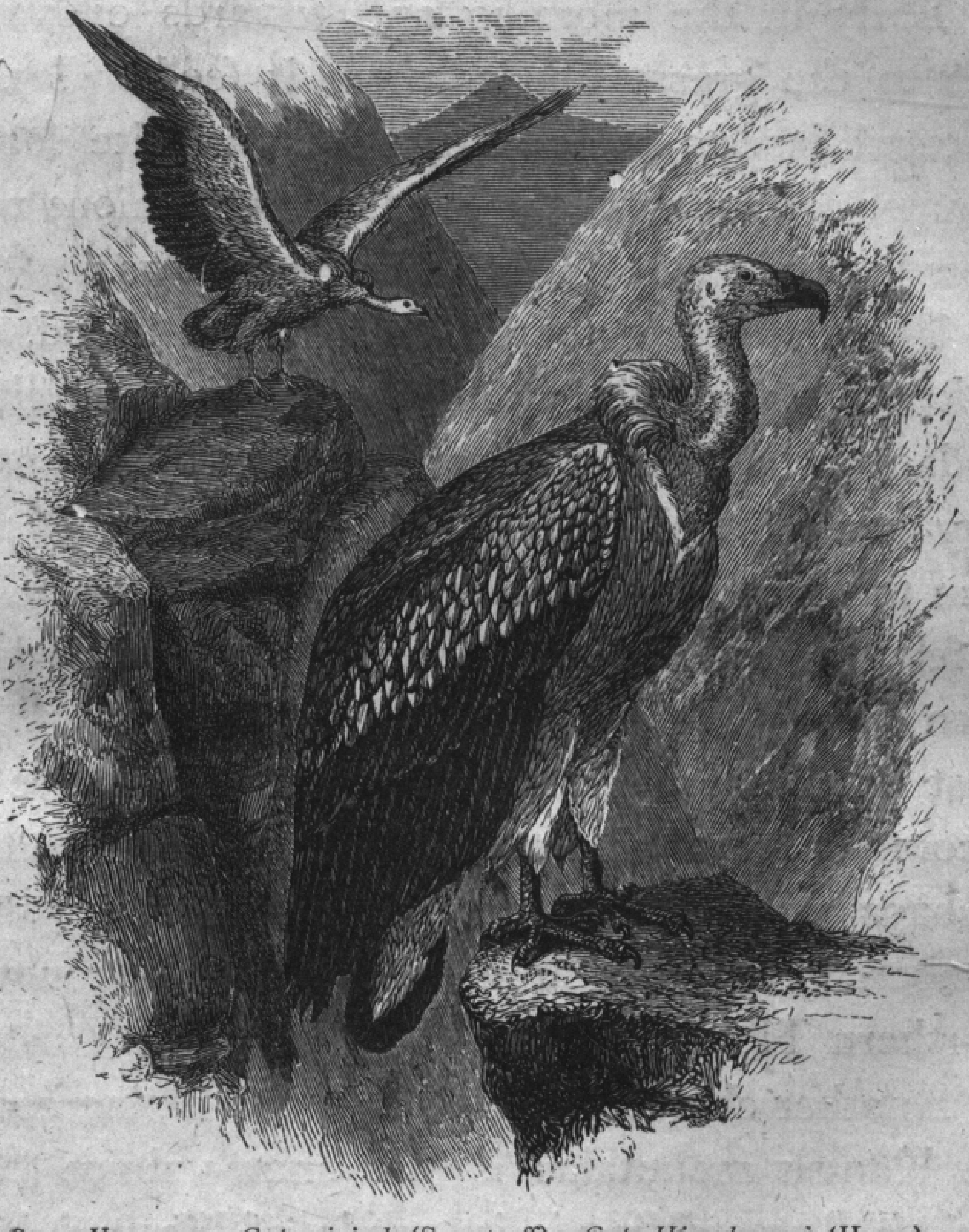
[1] This *hailik* or *Megaloperdix* is probably the 'Great Partridge,' which Marco Polo mentions in the Great Khan's mews at Chaghan-nor, Bk. I. chap. lx.—Y.

[2] The black vulture (*Vultur monachus*) is but rarely seen in Kan-su.

Late in the morning when the sun is already warm, the snow-vultures rise from their nocturnal haunts, which are invariably amongst the most inaccessible cliffs, and fly at first low along the axis of the range, then, circling upwards, soar to untold heights. When we have been encamped at an elevation of 12,000 feet I have watched them with a good field-glass ascending until they completely disappeared from sight, as each stroke of their powerful



SNOW-VULTURE. *Gyps nivicola* (Severtsoff). *Gyps Himalayensis* (Hume).

wings impelled them upwards. Yet from these heights the extraordinary vision of the vulture enables him to distinguish every thing that happens on earth. Now, it is a flock of crows and kites gathering round some carrion in the valley that attracts his attention, and makes him fold his mighty wings and descend by the weight of his body in a somewhat slanting direction from the clouds to earth, with a rustling noise caused by his rapid passage through the air; but before reaching the ground he opens his enormous wings and drops quietly on his prey. Warned by the manœuvres of their companion, his fellows are not slow to follow his example, and drop like stones to earth, so that before you knew of their existence a dozen or more of these huge birds are feasting on the carrion.[1] They then begin quarrelling among themselves, advancing with half-unfolded wings and threatening air to attack one another; but their fights are never serious. If the dead animal is still entire they tear out the entrails and liver, and then begin upon the flesh. Having gorged themselves, they retire a short distance to look on while their companions feast. The smaller birds of prey,—kites, crows, and magpies,—waiting impatiently at a little distance, dare not approach the tempting repast until these giants have eaten their fill and departed. The latter now rise heavily in the air, and betake themselves to the nearest cliffs, there to digest their food.

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[1] Brehm describes a similar sight with African vultures. (See his *Life of Animals*, vol. iii. pp. 562–564.)

Snow-vultures are numerous in Kan-su, and we often wondered how they could find sufficient food, especially as the Mongols, Tangutans, and Chinese often eat carrion themselves, and the vultures would have but a small share of the dead domestic cattle. In summer too, when the weather is rainy and the mountains are often clothed in mists, it must be extremely difficult, sometimes impossible, to see the prey from a distance, and it is probable that at this season the vultures take very distant flights to countries where the atmosphere is clearer. A flight of a few hundred miles is no exertion to this bird, which sails all day long beneath the clouds almost without flapping its wings.

Such is their rapacity that notwithstanding their habitual wariness they return to the carrion after they have been several times fired at. Their tenacity of life is almost incredible: my companion and I once fired a dozen charges of slugs at a number of them only fifty paces off, without killing one.

They may be easily shot with ball, however, if you will take up a position in ambush near some exposed food; but you must be careful to hide yourself, and your best plan is to select a small cave, and plant its entrance with bushes. The bait should be carrion, or any offal laid on a freshly drawn hide, and disposed about seventy paces from your place of concealment, to enable you to move at your ease without fear of startling the birds. It is of no use stationing yourself before eight or nine o'clock in the morning, when the vultures leave their eyries, and you should select the alpine belts of the mountains, to which they are more readily attracted than to the low valleys, where these cautious birds will sometimes absolutely refuse your bait, if any human habitations be near.

The sport is full of interest. Hardly have you seated yourself before the kites fly down and wheel in long low circles round the meat, but their suspicions are aroused and they take their departure. The next to appear are magpies and crows, cawing and hopping round the dainty morsels, without venturing to touch them. At last one bolder than the others seizes a piece of the meat, but, frightened at his own temerity, drops it again and retires. But the ice once broken, others soon follow suit. Here comes a raven who has been watching the proceedings from a short distance, and now with waddling gait approaches the carrion, and pauses a minute or two before thrusting his beak in and swallowing a morsel. Then magpies fall to; the kites, plucking up courage, descend from all sides, and the feast begins in earnest; such noise, such fighting and screeching!

All this time you remain perfectly still in your place of concealment, impatiently watching the expected arrival of the prize you covet. But hark! what is that rustling noise? a lammergeier has descended. Yes! it is indeed that handsome bird which, after wheeling a few times round the exposed meat, perches on yonder ledge. But where are the vultures? Perhaps they have by this time espied the feast and are circling high up among the clouds; but you cannot look up, and therefore cannot see them from your cave. Another good hour passes. At length your patience is rewarded. A rustling of heavy wings is heard, and the snow-vulture perches on a rock beside the carrion. You are trembling with excitement, fearful of making the slightest noise by which you would frighten the wary bird away. In a little while he flies down to the ground, and, after sitting still for a few minutes, walks towards the prey, swaying his great body from side to side and hopping occasionally. In a moment the whole crew of feasters retires to make room for the giant, one solitary crow perhaps remaining on the opposite side of the carcase, but his behaviour is now more deferential. Greedily the hungry vulture begins swallowing the entrails or the meat; in another minute, however, a shot is heard and he falls lifeless on the spot.

But if you defer your fire other vultures are sure to appear, and after the first one has cautiously descended the others alight directly on the meat, and sometimes a dozen or more will collect round a large carcase, and you may if you are fortunate secure two with one bullet.

The heavy snowfall in the alpine zone obliged us to remove our camp in the second week of May, and descend to the middle forest belt. From this my companion and a Cossack started for the temple of Chertinton, to fetch the boxes containing our collections which we had left behind with some other things in autumn. Among these was a pair of boots, of which I was very glad, for they enabled me to walk over the mountains with far greater comfort than in those I had improvised for myself. We had also stored five pounds of sugar, which was the greatest treat for us, deprived as we had been so long of every European comfort; and we bought a yak of the Tangutans which supplied us with meat for a long while.

In the middle of May the weather in Kan-su was spring-like and showery, and although night frosts continued, the heat of the sun during the day rapidly developed the vegetation. By the 27th of the month, the trees in the central zones were turning green, whilst on the lower ground they were in full leaf; the verdure looked brilliant when the sun shone,[1] and many of the bushes and herbaceous plants were covered with flowers. In the thick underwood on the banks of the mountain streams the wild rose, cherry, currant, gooseberry, honeysuckle, and the barberry, with its long yellow clusters of flowers, were in blossom; to these must be added the fragrant *Daphne Altaica* (?) and on the exposed slopes the hawthorn and yellow *caragana*. In the woods we saw anemones, wild hyacinths, peonies, and whole beds of wild strawberry; the valleys were gaily decked with iris, primrose, and potentilla; and the slopes of the mountains with saxifrage, *Draba*,

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[1] The 26th was the warmest day in May; the heat, 86° Fahr., in the valley of the Tatung-gol being equal to the hottest day in July the previous year.

Polygonatum roseum, *Thermopsis*, *Podophyllum*, and others.

Animal life too displayed full activity, especially among the feathered visitants of the forest zone, where the voices of song-birds sounded in concert, completing the general picture of spring. The exquisite melody of the thrush, and of its congeners the *Pterorhinus Davidii* and *Trochalopteron*, the note of the cuckoo, the call of the pheasant, and of a variety of smaller birds, resounded unceasingly for days together. Even at night time, in calm weather, some might be heard too impatient to restrain their songs till daybreak. Indeed everything around gave signs of returning life and activity after the long winter's silence.

Every day we obtained a number of most interesting specimens, and made up for the poor ornithological collection of the preceding summer when most of the birds were moulting.

Amongst the rarer kinds we secured some specimens of the long-eared pheasant (*Crossoptilon auritum*), which we had seen the first year of our travels in the mountains of Ala-shan. This remarkable bird, called by the Tangutans *shiarama*, inhabits in large numbers the forest-covered mountains of Kan-su, but is never found in the treeless ranges of Northern Tibet. It prefers forests on the sides of rocky mountains, and abounding in underwood, at an absolute elevation of 10,000 feet. It feeds exclusively on vegetable matter, and I found nothing but young grass, different kinds of herbs in its crop. While feeding its movements are stately, and it holds its magnificent tail straight out.

Late in autumn and in winter they collect in small coveys, often perching on the trees,[1] probably to feed on the leaf-buds. They pair in the early spring, and at such time keep to parts of the forest where the underwood is very dense, and where they rear their young;[2] they lay five to seven eggs.

In winter the Tangutans shoot them sitting on the trees or snare them for the sake of the tail-feathers. The four centre ones are much worn by Chinese officials in their uniform caps; and are worth *2d.* apiece here.

In early spring, as soon as they have paired, the male birds may be heard calling their mates. Their notes are harsh and discordant, and those of the hen birds equally so, as far as we could judge. We also heard them utter peculiar deep notes which reminded us a little of the cooing of doves, and when startled their cry was like that of the guinea-fowl.

During the breeding season they have no regular call, like that of the common pheasant or of black game. The cocks only call at irregular intervals, generally after sunrise, although sometimes before daybreak and at midday. In any case they are rarely heard, and one bird repeats its cry only five or six times during the morning.[1] The long and irregular intervals between their call-notes, and their extreme shyness, make it difficult to shoot them, at all events in spring; besides which, the uneven ground in which they are found, covered, on the northern sides of the ravines, with dense bushes of rhododendron, and on the southern slopes, with prickly bushes of barberry, hawthorn, and wild rose, added to the numerous rocks, and the fallen timber, make it most difficult sport. In such ground as this a dog is of no use, even were it able to follow its master up the steeper places. You have only your ears and eyes to assist you, and even these are not of much use, for the wary bird sees or hears you long before you can come up to it; it is a fast runner, and will never rise from the ground unless surprised. You may hear the patter of its feet a few paces off, as it disappears in some impenetrable thicket, before you have time to raise your gun, far less to shoot; and its tracks are as completely hidden as though it had dived under water. Its tenacity of life too is marvellous. I have seen them fly after receiving a whole charge of shot at fifty paces; and, if only winged, run into the bushes and escape. If by some extraordinary luck you happen to see one close by, you fire at once, as your only chance of a shot, and the charge blows the bird to pieces and spoils it for preserving. The difficulties indeed are so great, the odds against you so numerous, that nothing but the rarity of the bird induces you to try such thankless sport.

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[1] In spring and summer the long-eared pheasants keep exclusively on the ground, although during the night, as the native sportsmen declare, they roost on the trees: my companion and I, however, never saw one on a tree, although we took many walks in the evening and early morning in the woods.

[2] By the middle of May most of the hen birds were sitting on their nests.

My companion and I often went in pursuit of these pheasants, repairing to the woods long before daybreak, but only succeeded in obtaining two specimens; and two of the Tangutan sportsmen, whom I hired for that purpose, climbed the mountains day after day, but only succeeded in bringing home a couple by surprising them on their nests.

The great difficulty lies in discovering the whereabouts of the bird, owing to the long, irregular intervals between its cries, whilst it is sometimes absolutely silent even on a fine bright morning. It is remarkable, too, how quietly, for so large a bird, it rises off the ground, and takes wing without your having heard it. It is slow in its flight like the capercailzie, and will not fly far.

Among the mammals we noticed the marmot (*Arctomys robustus* ?), which awoke about the middle of April after lying dormant all winter. This little animal, called by the Mongols *tarabagan*, and by the Tangutans *shoo*, was never found by us in Mongolia,[1] and we first saw it in Kan-su, whence its range extends into Northern Tibet. It inhabits the lower valleys, as well as the alpine zone, of the Kan-su mountains, and we saw its burrows in Northern Tibet at an elevation of 15,000 feet above the sea.

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[1] The Trans-Baikalian marmot (*Arctomys Bobac*), is only distributed as far south as seventy miles beyond Urga; where the fertile steppes terminate and this little animal disappears.

It prefers to burrow in the sides of grassy mountains, and lives in small societies, burrowing deep into the stony ground; several side-passages serve as a means of ingress and egress into the principal chamber.

Early in the morning as soon as the sun is up, and the air a little warmed, it issues out of its habitation and scampers about feeding on the grass, not returning to its burrow, unless disturbed, till about ten o'clock, where it remains till two or three in the afternoon, when it again comes out and plays and feeds till sunset. This rule of course is not without exceptions, but in rainy weather they never stir above ground, although the rain may last several days in succession.

The Kan-su marmot is sagacious and wary, especially when it is hunted by man. Before leaving its burrow it pokes its head out, and remains half an hour in this position to assure itself of safety. Then half its body may be seen, and again it listens and looks all round, and then only comes quite out and feeds on the grass. If it notice danger, however far off, it immediately makes for its burrow, sits up on its hind legs and utters a loud, prolonged whistle; then if the object of its fears approach nearer it conceals itself again below the ground. But where it is in close proximity with the Tangutan yurtas and is not molested, its behaviour is bolder, although it never quite forgets its cautious cunning.

The usual mode of killing these animals is by lying in wait for them near the burrow, hiding before they come above ground. They are remarkably tenacious of life, and will escape to their burrows even though mortally wounded;[1] nothing but killing them outright will secure them for the hunter. They begin to lie dormant in the second week in October, and like the European marmot a great many will congregate in one burrow.

And now a few words about another of the mammalia of Kan-su, viz. the bear.

Before arriving in Kan-su we heard from the Mongols of some extraordinary animal which ranged through this province, and was known to the inhabitants under the name of *kung-guressu*, i.e. 'man-beast.' We were told that it had a flat face like that of a human being, and that it often walked on two legs, that its body was covered with a thick black fur, and its feet armed with enormous claws; that its strength was terrible, and that not only were hunters afraid of attacking it, but that the inhabitants removed their habitations from those parts of the country which it visited.

These accounts were corroborated by the Tangutans in Kan-su, who one and all declared that an animal answering to the above description inhabited their mountains, but that it was rare. When we questioned them if it were not a bear they shook their heads, and assured us it was not, adding that they knew well enough what a bear was like.

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[1] Dr. Hooker mentions the extraordinary tenacity of life of the Tibetan marmot (Hooker's *Himalayan Journals*, i. 93), and gives an

Upon arriving in Kan-su in the summer of 1872, we offered a reward of five lans to anyone who would show us where one of these fabulous beasts could be found. Nobody, however, came forward, to impart the desired information; unless that the Tangutan, who was acting temporarily as our guide, did certainly say that the *kung-guressu* inhabited the rocks on Mount Gadjur. But on our repairing to that sacred mountain, in the middle of August, we saw no trace of the extraordinary animal, and almost despaired of ever seeing one, when one day I heard that a skin might be seen at a little temple about ten miles from Chertinton. Hither we proceeded after a few days, and having made a present to the superior, requested him to show us the rare skin. The request was granted, when what was my astonishment to see, instead of some extraordinary animal, a small bear-skin stuffed with straw! All the stories we had heard were after all a pack of fables, and the narrators, after listening to my assurances that this creature was none other than a bear, declared that the *kung-guressu* never showed itself to people, and that its tracks alone were occasionally seen by huntsmen. This bear, whose skin I now saw, stood 4½ feet high; the muzzle protruding; the head and forepart of the body a dirty white colour; the back darker, and the paws almost black; the hind feet long and narrow, and the claws about an inch long, blunt, and of a dark colour. Unfortunately I could not take more accurate measurements, or examine it more closely, for fear of exciting suspicion.

In the following spring, as we were returning from Koko-nor to Chobsen, one morning, on the borders of a forest in Kan-su, we saw one of these bears wild and engaged in catching alpine hares. We went towards it; but it made off, and although pursued by our dogs, never turned to bay. We fired several long shots after the bear, but only wounded it, and to our extreme regret it got off.

The one we saw in Koko-nor, as far as we could judge in the distance, was of the same colour as the stuffed specimen we had seen at the temple, but rather larger, and about equal in size to our *flesh-eater*;[1] it seemed to have an unusual long body, and a kind of hump on its back.

The Mongols told us that they were plentiful on the Burkhan Buddha and Shuga ranges, where they inhabit the rocky parts, in summer, however, descending to the plains; and said they had even been seen on the banks of the Murui-ussu.

After passing the latter part of May in the central forest belt, we descended to the valley of the Tatung, and remained there a week, making daily shooting excursions as before; but our supply of small shot was soon expended, and we had to give up shooting small birds. Of eggs we obtained but a few; many of the birds not having begun to lay, although their nests were ready. In the middle of June we could have collected any number of them in the mountains, especially in the thickets on the banks of streams; but we could not remain longer in the vicinity of Chertinton, so straitened were our finances, which were again reduced to a small lump of silver weighing only a few ounces. Owing to the density of the population, moreover, game was scarce, and we could not shoot enough to supply ourselves with food. Under these circumstances we were constrained to hurry our departure for Ala-shan, for which country we set out, following the same route by which we had come the year before when travelling in the company of the Tangutan caravan. Deserted villages lay by the roadside then as now, although the Chinese population had begun to reappear; and it is most probable that in a few years' time the ruined houses will be rebuilt, the deserted fields cultivated, and the inhabitants as numerous as they were before the Dungan insurrection.

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[1] There are three kinds of bears in Russia: the *miasnik* or flesh-eater, so called because it attacks cattle, the *ovsiannik* or corn-eater, and the *muraved* or ant-bear.—M.

The first half of June was, contrary to our expectations, again characterised by severe, changeable weather. On May 28th there was a fall of snow at night, and the following four nights it froze (25° Fahr.). In the second week of June, the very last of our stay in Kan-su, the weather was even worse; for on the 9th of that month a violent storm continued the whole day, covering the ground to the depth of a foot with snow; towards morning there was a sharp frost (23° Fahr.), and this occurred in the thirty-eighth parallel, at a time when seventy-six kinds of flowers were blooming, which, however, remained uninjured by the cold, so accustomed are the plants of Kan-su to the severity of its climate. The slightest drought, on the other hand, is far more injurious to them. Rain fell on twenty-two days in May, but as it was not continuous, it was not enough for the herbaceous plants which require great moisture. We noticed this particularly on the exposed side of mountains, and in the plain to the north-east of the Chagrin-gol, where the year before, in the end of June, the flowers were more abundant and brilliant.

This only proves how elastic is the nature of these plants, and how capable they are of adapting themselves to the climate. I have myself taken up by the root the yellow alpine poppy (*Papaver alpinum*) when the earth has been so hard frozen that I could hardly cut into it with my knife, yet the plant was uninjured, whereas it would perish if it were not for the incessant rains.

We took leave of the highlands of Kan-su, having experienced to the very last their inclement, unsettled climate; still the variety and abundance of the scientific harvest that we reaped there in the vegetable and animal kingdoms make us regard our stay in that region as the best time of our whole enterprise.

CHAPTER VIII.

RETURN TO ALA-SHAN. ROUTE TO URGA BY THE CENTRAL GOBI.

Departure from Ala-shan—Nearly lost in the desert—A dilemma—We follow the wrong road—A night of suspense—Looking for landmarks—The 'obo'—Water at last!—Meeting with pilgrims—Din-yuan-ing—Letters from home—Excursion to Ala-shan mountains—Their changed appearance—Their flora and fauna—Sudden flood—Collections endangered—Caravan re-organised—Start for Urga—Terrible heat—Guide at fault—Death of 'Faust'—Desperate situation—Saved—Grief at the loss of our dog—Route across the Gobi—Urute country—The Galpin Gobi—Wells choked by rain—Similarity between Gobi and Sahara—The Hurku range—Mountain goat (*Capra Sibirica*)—Trade routes—The desert north of the Hurku—Shortlived oases—Large and flourishing herds—Polluted water—The mirage—Migration of birds—More trade routes—Altered aspect of country—Rich pasturage—Abundance of animal life—Climate—Impatience to reach Urga—Arrival there—End of the Expedition.

THE second week in June we left the high lands of Kan-su, and crossed the threshold of the desert of Ala-shan. The sand drifts now lay before us like a boundless sea, and it was not without sundry misgivings that we entered this forbidding realm.

Without sufficient means to enable us to hire a guide, we went alone, risking all dangers and difficulties, the more imminent because the year before, while travelling with the Tangutan caravan, I could only note down by stealth, and often at haphazard, itinerary was of course inaccurate, but now it served as our only guide.

We were fifteen days[1] marching from Tajing to Din-yuan-ing, and safely accomplished this difficult journey, only once nearly losing ourselves in the desert. This happened on the 21st June between Lake Serik-dolon and the well of Shangin-dalai. Having left Serik-dolon early in the morning, we marched through miles of loose sands, and at last came to an expanse of clay where the track divided. We had not noticed this spot on the outward journey, and had therefore to guess which of the two roads would lead to our destination. What made it worse was that the angle of bifurcation being acute, we could not decide, even with the aid of a compass, which we ought to take. The track to the right being more beaten, we determined to follow it, but after all we were mistaken, for having gone a few miles a number of other tracks crossed ours. This fairly puzzled us, however we still pressed forward, till at length a well-beaten road[2] joined the one we had first chosen. This we durst not follow, for it went we knew not whither, nor could we return to the place where the roads first branched off. Choosing the lesser of two evils, we resolved to persevere in our first route, hoping soon to see the group of hills at whose foot lies the well of Shangin-dalai.

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[1] Including three days' halt.

[2] We afterwards ascertained that this cart-road led from Din-yuan-ing to the town of Dirisun-khoto (Mongol name), near the south-eastern boundary of Ala-shan.

But it was midday, and the intense heat obliged us to halt for two or three hours. On resuming our march, with the aid of the compass we steered in the same direction as before, till at length we discerned a small group of hills to our right. These we supposed to be the landmark of the Shangin-dalai, but they were still a long way off, and the dust which pervaded the atmosphere the whole day prevented our seeing their outline distinctly even with a glass.

Evening fell and we halted for the night, fully confident that these hills were indeed those we were in search of. But on projecting our line of march on the map, I became aware how far we had diverged to the right of our proper course, and doubts arose as to whether we were really in the right road or not. In the meanwhile, only five gallons of water[1] were left for the night; our horses had had none, and were suffering such agonies of thirst that they could hardly move their legs. The question of finding the well on the morrow became one of life and death. How can I describe our feelings as we lay down to rest! Fortunately the wind fell and the dust in the air cleared off. In the morning, with the first glimmer of light I climbed on to the top of the pile of boxes containing our collections, and carefully scanned the horizon with a glass. I could see distinctly the group of hills we had remarked the previous day,

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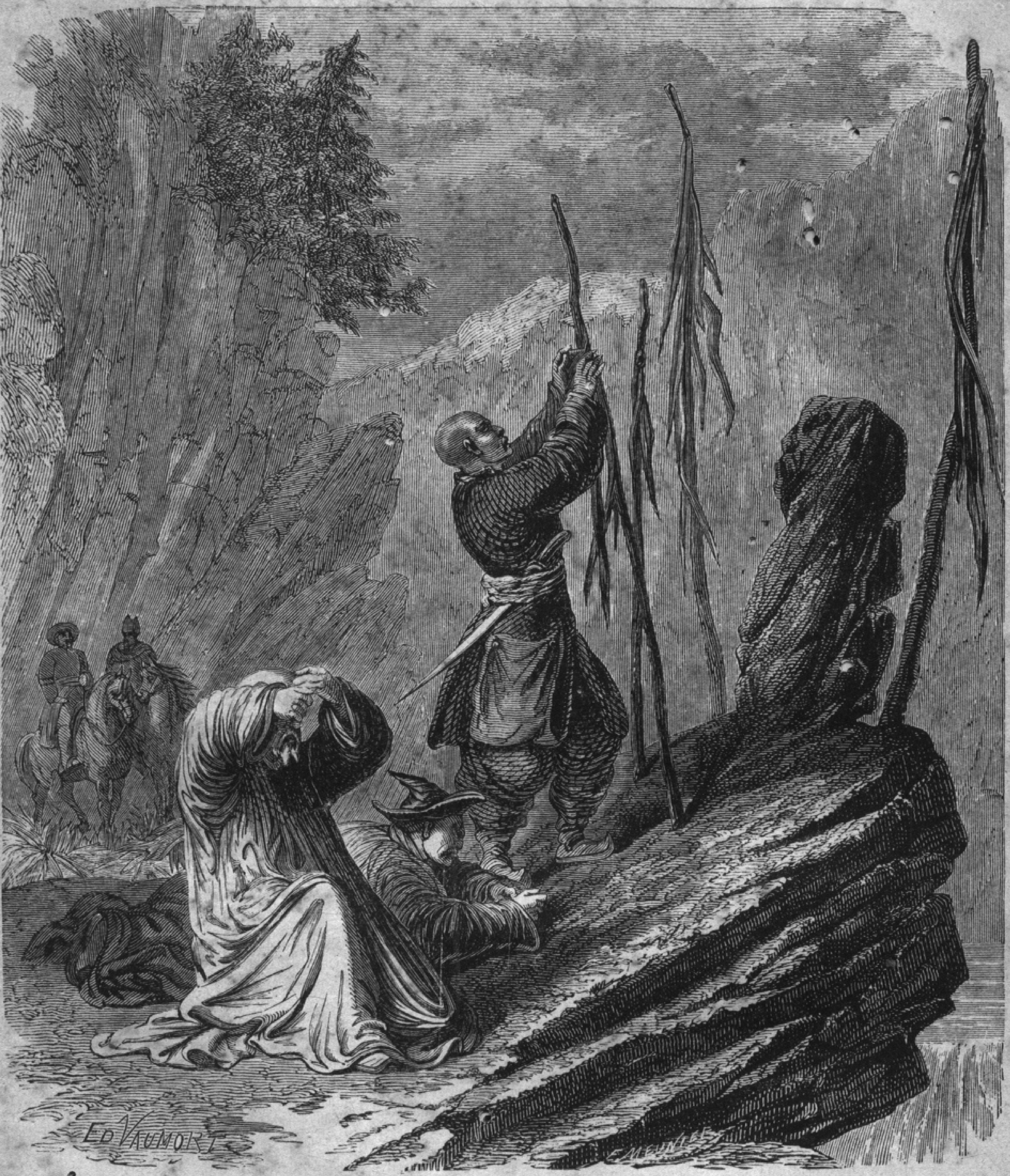
[1] Water in wooden casks soon evaporates from the heat, so that a cask filled in the morning generally loses what would fill several bottles before evening.


ED VAUMORT
E. MEAULLE

MONGOLS WORSHIPPING 'OBO.'

but in a direction due north of our halting place; I could also distinguish the summit of another, which might perhaps be that of Shangin-dalai. Towards which should we direct our steps? Having taken careful bearings of the latter, and having compared its position on the map with that noted down last year, we decided to march in that direction.

In doubt and anxiety we loaded our camels and started, the hill now and then visible above the low ridges, and now and again hidden from sight. In vain we strained our eyes through the glass to see the cairn of stones ('obo') piled upon its summit; the distance was still too great to distinguish anything so small. At length, after having gone nearly seven miles from the halting place, we descried what we sought; with strength renewed by hope we pressed onwards; and in a few more hours we stood by the side of the well, to which our animals, tortured with thirst, rushed eagerly forward.

On one of the marches through Southern Ala-shan we met a caravan of Mongol pilgrims on their way from Urga to Lhassa. Ever since the outbreak of the insurrection, i.e. for eleven years, these votaries of the Dalai-Lama had not ventured to visit his capital; now however, since the occupation of central Kan-su by Chinese troops, a large caravan[1] had been equipped at Urga to proceed in search of the Kutukhtu, who had died a few years before at Bogdo-kuren, and was reported to have been re-born in Tibet. The pilgrims were marching in échelons, some distance apart, having agreed to rendezvous at Koko-nor. As the foremost files met us, they exclaimed, 'See where our brave fellows have got to!' and could hardly believe at first that we four had actually penetrated into Tibet. But what must have been the appearance of the Russian *molodtsi*?[1] Exhausted with fatigue, half-starved, unkempt, with ragged clothes and boots worn into holes, we were regular tatterdemalions! So completely had we lost the European aspect that when we arrived at Din-yuan-ing the natives remarked that we were the very image of their own people! i.e. of the Mongols.

At Din-yuan-ing we received a thousand lans in money, sent to us from Peking by General Vlangali. We also received letters from Russia,[2] with three of the last numbers of the 'Goloss' for 1872. No words could depict our pleasure at sight of these. We read with feverish impatience letters and newspapers which, although more than a year old, were new to us. Europe, our country, old times, rose up before us with startling vividness, and we became more than ever sensible of our lonely position in the midst of a people alien not in aspect alone but in every shade of character.

The Prince of Ala-shan and his sons were not at

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[1] *Molodtsi*, i.e. brave fellows.

[2] I cannot refrain from mentioning an absurd incident with referfence to a letter sent me from one of the governmental towns of my fatherland. The address was 'Peking, viâ Kiakhta.' The word Peking had been erased doubtless by the postmaster, and the following words written in large letters: 'There is no such town as Peking, therefore forward this only as far as Kiakhta.'

Din-yuan-ing, having gone to Peking, whence they would not return before the autumn.

In accordance with the plan we had previously sketched, we purposed marching straight to Urga from Din-yuan-ing, by way of the Central Gobi, a route which had never before been travelled by any European, and was therefore of the greatest scientific interest. Before starting, however, we determined to rest, and to take this opportunity of exploring more thoroughly than last time the mountains of Ala-shan.

These were not so deserted as they had been when we saw them in 1871, for, upon the cessation of brigandage, many of the Mongols had returned hither; ruined temples were being restored; and hundreds of Chinese from Ning-hia were engaged in felling timber. The difficulty was to find a ravine untenanted by some of these people, and we were obliged after all to choose one in which there was no water, preferring to be two miles away from such a necessary to abiding cheek by jowl with either Mongols or Chinamen.[1] We sent our camels out to grass about thirty miles from Din-yuan-ing, keeping with us only the two horses, which took it in turn to fetch water.

Here we stayed three weeks, and finally came to the conclusion that the mountains of Ala-shan are rich neither in flora nor in fauna. As regards the

[1] The ravine in which we were encamped is eleven miles WSW.

former (at all events in the western side which we explored), the range may be divided into three belts, viz. the marginal, the tree-belt, and that of the alpine meadow-land.

The first of these, with the strip of undulating plain belonging to it,[1] has an argillaceous soil studded on the plain with boulders, and on the hills with blocks of fallen rock. In this section the cliffs are smaller and fewer in number than in the other two. This marginal zone or skirt of the mountains is nowhere over a mile and a half in width.

Here the only trees are occasional stunted elms; amongst the bushes we observed the yellow briar (*Rosa pimpinellifolia*), the *caragana*, and an occasional *Ephedra*, such as we had seen in Tsaidam, at the foot of the northern slope of the Burkhan Buddha; nearer the mountains the commonest kinds are the thorny convolvulus (*Convolvulus tragacanthoides*), and prickly astragalus (*Oxytropis aciphylla*). The chief herbaceous plants are the thyme (*Thymus serpyllum*), Solomon's seal (*Polygonatum officinale*), *Pegonum nigellastrum* (the last named belonged exclusively to the plain), the onion, also growing on the mountains as high as the alpine region, the

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[1] The belt of steppe, ten to thirteen miles wide, lying at the foot of the western side of the Ala-shan range, is of a distinct character, differing from other parts of this country. Its surface is seamed with deep gorges, and it has a general and in some places a very steep slope from the mountains to the plain. Its soil is clay covered with shingle or coarse sand, and studded with small fragments of fallen rock from the neighbouring hills; springs occur in parts of it, and the vegetation is the same as that of the desert, with the addition of some mountain plants.

Androsace on the rocks, Siberian milkwort (*Polygala Sibirica*), clematis (*Clematis æthusæfolia*), twining through the bushes at the entrances to ravines, but seldom found on the plain, and on the border of the mountains the rhubarb,[1] likewise found in the tree-belt as high as the alpine region.

The upper limit of the forest zone is 10,000 feet above the sea, the western side of the range being the most densely wooded, and especially the slopes which face the north. The variety of trees, however, is not great. The prevailing kinds are the spruce (*Abies obovata* ?), the poplar (*Populus tremula*), and willow, interspersed with arborescent juniper (*Juniperus communis* ?), more rarely with the white birch (*Betula alba*); and, on the eastern side of the mountains, with the pine. All these trees are small and stunted, and can bear no comparison with those of Kan-su.

Amongst bushes in the Ala-shan forests we observed spiræa, white and yellow kurile tea (*Potentilla glabra*, *P. tenuifolia*), and hazel (*Ostryopsis Davidiana*) on the open hillsides facing the south, especially on the eastern side of the mountains, the honeysuckle; the juniper too is to be seen trailing its long branches over the rocks on the outskirts of the mountains.

There is more variety of bushes in the wooded ravines, where we saw syringa (*Syringa vulgaris*) like the familiar plant of our gardens, a new species of cotoneaster growing on the hillsides; two kinds of currant (*Ribes pulchellum* and another), raspberry (*Rubus Idæus*), and the climbing *Atragene alpina.*

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[1] Not the medicinal, and different from the two species of Kan-su.

The commonest herbs were the red lily (*Lilium tenuifolium*), French honeysuckle (also found in the lower alpine meadow-land), several kinds of *astragalus*, violets, several varieties of *pedicularis*, including one conspicuous for its pink flowers, *Rhaponticum uniflorum* and *Polygonatum Sibiricum.* Where the ground was moist we observed a greater variety of herbaceous plants; valerian, meadow-rue, the willow herb (*Epilobium angustifolium*), dandelion (*Taraxacum officinale*), columbine (*Aquilegia viridiflora*), wormwood, *Silene repens*, *Rubia cordifolia*, and *Sanguisorba alpina*, often growing in patches in the alpine meadows. The vegetation of the tree-belt is richer than either of the others, although far less luxuriant than that of Kan-su.

The alpine region, which begins at an elevation of 10,000 feet, is of comparatively small extent, more limited even than that of the Munni-ula range. Here we saw the beautiful *caragana*, covered with white and pink blossoms early in July, the meadow-sweet, the white kurile tea (the same we had seen in the forests), and a low kind of willow.

In the lower alpine belt, besides many of the flowers we have already enumerated, we observed ranunculus, larkspur, beautiful carnations (*Dianthus superbus*), onion, and corydalis. On the higher ground bushes cease altogether, the *caragana* being the only one to appear up to the very summit of Mount Bugutui; but here its proportions are dwarf-like, and its height from the ground not above twelve inches.

The herbaceous plants diminish in variety, and the clay of the soil becomes more bare as we ascend. At the very summit of the alpine zone, the commonest plants are the *Polygonum*, *Saussurea pygmæa*, and a kind of *Hesperis*.

Indeed the alpine meadow-land does not shine in flowers. The breath of the neighbouring deserts exercises a withering influence over the vegetation in all parts of these mountains, which are far more deficient than those of Kan-su or even than the Munni-ula, yet resembling the former rather than the latter.

The fauna of the Ala-shan can boast neither number nor variety; such as it is I have given it in Volume I., Chapter VI. Birds are few, even in summer; besides those previously mentioned, I found most commonly at this season: the bullfinch (*Pyrrhula erythrina*), two kinds of *carpodacus*, the swift (*Cypselus leucopygus*), mountain swallows (*Hirundo rupestris* and *H. lagopoda*), the cuckoo (*Cuculus canorus*), the bunting, redstarts (*Ruticilla* nov. sp., and another), the *Phyllopneuste*, and the stone-thrush (*Petrocincla saxatilis*). There are neither pheasants nor woodpeckers.

The scarcity of birds in these mountains makes them mournful even in summer when all nature is stirring; no joyful notes enliven the gloomy forests or beetling cliffs. Only an occasional song may be heard in the early morning or late evening; in the daytime a desert-like stillness pervades everything. In conclusion, we may remark that both in flora and fauna this range has a greater affinity to the Kan-su than to the In-shan system.

If such arid mountains as these one would have supposed that we should not have incurred the slightest risk from water; but fate willed that we should experience every misfortune which can possibly overtake the traveller in these countries, for, without giving us the slightest warning, a deluge, such as we never remember to have seen, swept suddenly down upon us.

It was on the morning of the 13th July; the summits of the mountains were enveloped in mist, a sure indication of rain. Towards midday, however, it became perfectly clear and gave every promise of a fine day, when, three hours later, all of a sudden, clouds began to settle on the mountains, and the rain poured down in buckets. Our tent was soon soaked through, and we dug small trenches to drain off the water which made its way into the interior. This continued for an hour without showing any signs of abatement, although the sky did not look threatening. The rainfall was so great that it was more than could be absorbed by the soil or retained on the steep slopes of the mountains; the consequence was that streams formed in every cleft and gorge, even falling from the precipitous cliffs, and uniting in the principal ravine, where our tent happened to be pitched,[1] descended in an impetuous torrent with terrific roar and speed. Dull echoes high up in the mountains warned us of its approach, and in a few minutes the deep bed of our ravine was inundated with a turbid, coffee-coloured stream, carrying with it rocks and heaps of smaller fragments, while it dashed with such violence against the sides that the very ground trembled as though with the shock of an earthquake. Above the roar of the waters we could hear the clash of great boulders as they met in their headlong course. From the loose banks and from the upper parts of the defile whole masses of smaller stones were detached by the force of the current and thrown up on either side of the channel, whilst trees were torn up by their roots and rent into splinters.

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[1] Our ravine was two miles long and only 350 feet wide; it was hemmed in on all sides by steep slopes and precipitous rocks.

In the meanwhile the rain continued with undiminished violence, and the torrent kept ever swelling. The deep bed of the ravine was soon choked with stones, mud, and fallen timber, which forced the water out of its channel on to higher ground. Barely twenty feet from our tent rushed the torrent, destroying everything in its course. Another minute, another foot of water, and our collections, the fruit of our expedition, were irrevocably gone! The flood had been so sudden that we had not a chance of rescuing them; all we could have done would have been to save our own lives by climbing on the nearest rocks. The disaster was so unexpected, the ruin so imminent, that a feeling of apathy took possession of me, and although face to face with so terrible a misfortune I could not realise it.

Fortune, however, again befriended us. Before our tent was a small projecting ledge of rock upon which the waves threw up stones which soon formed a breakwater, and this saved us. Towards evening the rain slackened, the torrent quickly subsided, and the following morning beheld only a small stream flowing where the day before the waters of a mighty river had swept along. A bright sun lit up the scene of yesterday's destruction, and displayed so complete a change in the appearance of the valley that we could not recognise it for the same.

On returning to Din-yuan-ing we equipped our caravan, bartered away our bad camels, bought new ones, and on the morning of the 26th July started on our journey. Thanks to our Peking passport, and still more to the presents we bestowed on the *tosalakchi*, who acted as regent during the Prince's absence, we were able to hire two guides to escort us to the border of Ala-shan, where we were to obtain others, and for this purpose the yamen (or magistracy) of Ala-shan issued an official document: in this way we continued to obtain guides from one banner to another; a matter of great importance, for our road lay through the wildest part of the Gobi, in a meridional direction from Ala-shan to Urga, and we could not possibly have found our way without them.

Another long series of hardships now awaited us. We suffered most from the July heat, which at mid-day rose to 113° Fahr. in the shade, and at night was never less than 73°. No sooner did the sun appear above the horizon than it scorched us mercilessly. In the daytime the heat enveloped us on all sides, above from the sun, below from the burning ground; the wind, instead of cooling the atmosphere, stirred the lower strata and made it even more intolerable. On these days the cloudless sky was of a dirty hue, the soil heated to 145° Fahr., and even higher where the sands were entirely bare, whilst at a depth of two feet from the surface it was 79°.

Our tent was no protection, for it was hotter within than without, although the sides were raised. We tried pouring water on it, and on the ground inside, but this was useless, in half an hour everything was as dry as before, and we knew not whither to turn for relief.

The air, too, was terribly dry;[1] no dew fell, and rain-clouds dispersed without sending more than a few drops to earth. We observed this interesting phenomenon several times, particularly in Southern Ala-shan near the Kan-su mountains, where the rain, as it fell, met the lower heated atmosphere and passed off in steam[2] before reaching the earth. Thunderstorms rarely occurred,[3] but the wind was incessant night and day, and sometimes blew with great violence, chiefly from the south-east and south-west. On calm days tornadoes were frequent about the middle of the day or a little later. To avoid the heat as much as possible we rose before daybreak; tea-drinking and loading the camels, however, took up so much time that we never got away before four or even five o'clock in the morning. We might have lightened the fatigue considerably by night-marching, but in that case we should have had to forego the survey which formed so important a part of our labours. The line on the accompanying map marking our route from Din-yuan-ing to Urga is barely over a foot long, yet it was obtained at the cost of forty-four marches, mostly accomplished in the burning midday heat of the desert.

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[1] The difference between the wet and dry bulbs of the thermometer was sometimes as great as 39°, with the temperature at 113°.

[2] This phenomenon only occurred when the clouds were too small to cool the atmosphere sufficiently.

The commencement of our journey was unpropitious, for on the sixth day after we left Din-yuan-ing, we lost our faithful friend 'Faust,' and we ourselves nearly perished in the sands.

It was on the 31st July; we had left Djaratai-dabas and had taken the direction of the Khan-ula mountains; our guide having informed us that a march of eighteen miles lay before us that day, but that we should pass two wells about five miles apart.

Having accomplished that distance, we arrived at the first, and after watering our animals, proceeded, in the full expectation of finding the second, where we intended to halt; for though it was only seven in the morning, the heat was overpowering. So confident were we that the Cossacks proposed to throw away the supply of water that we had taken in the casks, in order not to burden our camels needlessly, but fortunately I forbade their doing this. After nearly seven miles more, no well was to be seen, and the guide announced that we had gone out of our road. So he proceeded to the top of a hillock in the immediate neighbourhood to obtain a view over the surrounding country, and soon afterwards beckoned to us to follow. On rejoining him, he assured us that although we had missed the second well, a third, where he purposed passing the night, was scarcely four miles farther. We took the direction indicated. In the meanwhile it was near midday and the heat intolerable. A strong wind stirred the hot lower atmosphere, enveloping us in sand and saline dust. Our animals suffered frightfully; especially the dogs, obliged to walk over the burning sand. We stopped several times to give them drink, and to moisten their heads as well as our own. But the supply of water now failed! Less than a gallon remained, and this we reserved for the last extremity. 'How much farther is it?' was the question we constantly put to our guide, who invariably answered that it was near, that we should see it from the next sand hill or the one after; and so we passed on upwards of seven miles without having seen a sign of the promised well. In the meanwhile the unfortunate 'Faust' lay down and moaned, giving us to understand that he was quite unable to walk. I then told my companion and guide to ride on, charging the latter to take 'Faust' on his camel as he was completely exhausted. After they had ridden a mile in advance of the caravan the guide pointed out the spot where he said the well should be, apparently about three miles off. Poor 'Faust's' doom was sealed; he was seized with fits, and Mr. Pyltseff, finding it was impossible to hurry on, and too far to ride back to the caravan for a glass of water, waited till we came up, laying 'Faust' under a clump of *saxaul* and covering him with saddle-felt. The poor dog became less conscious every minute, gasped two or three times, and expired. Placing his body on one of the packs, we moved on again, sorely doubting whether there were really any well in the place pointed out to us by the guide; for he had already deceived us more than once. Our situation at this moment was desperate. Only a few glasses of water were left, of which we took into our mouths just enough to moisten our parched tongues; our bodies seemed on fire, our heads swam, and we were close upon fainting. In this last extremity I desired a Cossack to take a small vessel and to ride as hard as he could to the well, accompanied by the guide, ordering him to fire at the latter if he attempted to run away. They were soon hidden in a cloud of dust which filled the air, and we toiled onwards in their tracks in the most anxious suspense. At length, after half an hour, the Cossack appeared. What news does he bring? and spurring our jaded horses, which could hardly move their legs to meet him, we learned with the joy of a man who has been snatched from the jaws of death, that the well had been found! After a draught of fresh water from the vesselfull that he brought, and having wet our heads, we rode well of Boro-Sondji. It was now two o'clock in the afternoon; we had, therefore, been exposed for nine consecutive hours to frightful heat, and had ridden upwards of twenty miles.

After unloading the camels, I sent a Cossack back with the Mongol for the pack which had been left on the road, by the side of which our other (Mongol) dog, who had been with us nearly two years, was laid. The poor brute had lain down underneath the pack but was still alive, and after getting a draught of water he was able to follow the men back to camp. Notwithstanding the complete prostration of our physical and moral energies, we felt the loss of 'Faust' so keenly that we could eat nothing, and slept but little all night. The following morning we dug a small grave and buried in it the remains of our faithful friend. As we discharged this last duty to him my companion and I wept like children. 'Faust' had been our friend in every sense of the word! How often in moments of trouble had we caressed and played with him, half forgetting our griefs! For nearly three years had he served us faithfully through the frost and storms of Tibet, the rain and snow of Kan-su, and the wearisome marches of many thousand miles, and at last had fallen a victim to the burning heat of the desert; this too within two months of the termination of the expedition!

The route taken by most of the caravans of pilgrims from Urga to Ala-shan on their way to Tibet, turns a little to the west at the Khan-ula mountains, afterwards taking the direction of the Khalka country. We did not follow this road because the wells along it were not sufficiently numerous, and had been neglected since the outbreak of the rebellion.[1]

Our course lay due north,[2] and after crossing some spurs of the Kara-narin-ula entered the country of the Urutes, which lies wedge-shaped between Ala-shan and the Khalka country.

This country is considerably higher than Ala-shan, but soon begins to sink towards the Galpin Gobi plain, where the elevation is only 3,200 feet; north of this again it rises towards the Hurku mountains which form a distinct definition between the barren desert on the south and the more steppe-like region on the north. There is also a slope from the ranges bordering the valley of the Hoang-ho westward to the Galpin Gobi, which forms a depressed basin, no higher than Djaratai-dabas, extending, as we were informed by the Mongols, for twenty-five days' march from east to west.

The soil of the Galpin Gobi, in that eastern portion of it which we crossed, consists of small pebbles or of saline clay almost devoid of vegetation; the whole expanse of country to the Hurku range being a desert as wild and barren as that of Ala-shan, but of a somewhat different character. The sand-drifts, so vast in the latter country, are here of comparatively small extent, and in their stead we find bare clay, shingle, and naked crumbling rocks (chiefly gneiss) scattered in low groups. Vegetation consists of stunted half-withered clumps of *saxaul*, *karmyk*, *budarhana*, and a few herbaceous plants, the chief amongst which is the *sulhir*; the elms[1] are the most striking features in the Urute country, forming in places small clumps; bushes of wild peach[2] are also occasionally met with, such as are never seen in the desert of Ala-shan. Animal life in these regions is very scant; birds and mammals are the same as in Ala-shan. You may often ride for hours together without seeing a bird, not even a stone-chat or a *kolo-djoro*; nevertheless, wherever there are wells or springs, Mongols are to be found, with a few camels, and large numbers of sheep and goats.

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[1] The Urga caravan, which started in the summer of 1873 for Lhassa to find the Kutukhtu, crossed the Gobi in small échelons and by different routes. People were sent in advance along the high road, to clear out old and dig new wells; notwithstanding which there was a scarcity of water.

[2] There is no road here, and you may sometimes go seventy miles

During our progress through this country, in the latter half of August, the heat was excessive, although never so high as in Ala-shan. Winds blew ceaselessly night and day, often increasing to the violence of a gale, and filling the air with clouds of saline dust and sand, the latter choking up many of the wells; but these were more frequently destroyed by the rains, which, although rare, came down with terrific force, and for an hour or two afterwards large rivers continued to flow, silting up the wells (always dug on the lower ground) with mud and sand. It would be impossible to travel here without a guide thoroughly acquainted with the country; for destruction lies in wait for you at every step. In fact this desert, like that of Ala-shan, is so terrible that, in comparison with it, the deserts of Northern Tibet may be called fruitful. There, at all events, you may often find water and good pasture-land in the valleys; here, there is neither the one nor the other, not even a single oasis; everywhere the silence of the valley of death.

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[1] These trees are from 15 to 20 feet high and 2 to 4 feet thick; they are mostly met with in dry rainwater courses, probably because they find more moisture here.

[2] There is no wild peach in the Ala-shan mountains, or in those of Kan-su and Northern Tibet.

The well-known Sahara[1] can hardly be more terrible than these deserts, which extend for many hundreds of miles in length and breadth. The Hurku hills, where we crossed, are the northern definition of the wildest and most sterile part of the Gobi, and form a distinct chain with a direction from SE. to WNW.; how far either way we could not say positively; but, according to the information we received from the natives, they are prolonged for a great distance towards the south-east, reaching the mountains bordering the valley of the Hoang-ho, while on the west they extend, with a few interruptions, to other far distant mountains of no great elevation. If the latter statement may be relied upon, we may conclude that they unite with the Thian Shan, and supply, as it were, a connecting link between that range and the In-shan system; an extremely interesting fact and one worthy the attention of future explorers.

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[1] In the Sahara desert we find the same diversity in composition and altitude; the same immense tracts of shingly and saline soil; the same loose drifting sands, with occasional patches of rocky ground covered with thorny scrub, while at distant intervals an oasis or islet of vegetation occurs. Such are also the characteristics of the great deserts of Persia and Arabia, which form the prolongation eastward and northward of the Sahara—'the whole tract from the Sahara to the

Their width where we crossed them is a little over seven miles, and their apparent height hardly above a thousand feet. The chief formation is porphyry, of which the loose *débris* scattered over their slopes is composed. Springs of water are extremely rare, and the appearance is desolate and lifeless. They are almost devoid of vegetation, except where an occasional dwarf peach, acacia, and *Sarcosygium xanthoxylon* appear, or where along the dry watercourses the *karmyk* and *dirisun*, or more rarely still the elm, is seen. There is a remarkable absence of birds, and it is only now and then that you see a vulture, a lammergeier, a kestrel, a partridge (*Perdix Chukor*), or a stone-chat (*Saxicola Isabellina*).

Yet despite their barrenness, the Hurku hills are inhabited by a large and rare animal, the mountain goat (*Capra Sibirica*), called by the Mongols *Ulan-yaman*,[1] which is also said to have its habitat in the Yegrai-ula mountains in the north-western angle of Ala-shan, not far from the town of Sogo.[2] In the whole course of our three years' wanderings we only found this animal in the Hurku hills, and our eagerness to secure its skin for our collection was proportionately great. But in this we were unsuccessful, for the simple reason that our make-shift boots[1] were unfit for climbing over the steep rocky ledges, and this caused us frequently to miss our footing, to the great risk of our guns, or still worse, of our necks. Nevertheless we climbed half a day over these hills, at times literally 'on all fours,' and after completely exhausting ourselves we were convinced that shod as we were it was impossible to slay this wary animal.

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[1] I.e. red goat.

[2] This town is ten days' journey (about 170 miles) north-west of Din-yuan-ing: it was not occupied by the Dungans.

South of the Hurku lies the great trade route from Peking, *viâ* Kuku-khoto and Bautu, to Hami, Urumchi and Kulja,[2] branching off near the spring of Bortson, where we encamped for the night, whence one branch leads to the town of Suh-chau. We were told that before the Dungan insurrection the traffic along these roads was considerable, and wells were dug at frequent intervals; now, however, nobody goes that way.

The Hurku hills are the northernmost limit of the distribution of *saxaul*,[3] of the sand-martin and sparrow (*Passer ammodendri*) of Ala-shan; here too we saw for the last time *Perdix Chukor*.

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[1] Chinese boots with felt soles are unfit for the European. We tried wearing them, but after an hour's walk rubbed our feet sore.

[2] The former province of Ili.

[3] However, Mongols say that *saxaul* grows north of the Hurku chain, in the bare sands near the trade route between Kuku-khoto and

Northwards the character of the desert exhibits a marked change. The bare sand-drifts which cover so vast an expanse of the Urute country soon terminate;[1] and in their place we find a clay soil covered with pebbles. But the topography continues the same; level or slightly undulating plains studded with low hills, now connected in low ridges, now standing in isolated groups, composed of silicious slate, gneiss, and some of the later igneous rocks. There is scarcely any vegetation, and indeed it is also scanty on the plains. Wherever the soil is saline the *karmyk* and *budarhana* appear, as in the former tract, and where it improves a little, scrub wormwood and onion are most conspicuous, the latter being characteristic of this region, together with the *dirisun* and a few more of the *Gramineæ* composing the flora of the desert. Vegetation, however, is in every part of the Gobi mainly dependent on rains; for no sooner have these fallen, and the sun's rays exerted their influence, than the young plants shoot up with a rapidity which compensates for their long period of inactivity. Green oases quickly manifest themselves where all was desert; the *dzeren* appears, the loud song of the Mongol lark is heard; the inhabitants remove hither, and the favoured spot teems with life in the midst of surrounding desolation. But how brief a time it lasts! The powerful sun gradually evaporates all moisture and withers the grass, trampled under foot by the enormous herds of cattle; the Mongols depart; the dzerens seek other pastures; the larks fly away; and the desert remains as silent as the grave.

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[1] I should mention, however, that sand-drifts occur sporadically in all parts of the Gobi, but are less continuous here than in Ala-shan

The elevation of the Gobi between the Hurku hills and Urga along our line of march nowhere exceeds 5,500 feet, nor falls below 4,000. No depressions occur in this tract, like those of Djaratai-dabas and the Galpin Gobi, or that along the Kiakhta-Kalgan road; the whole region is a lofty plateau, varying in height between these two extremes.

The Central Gobi, like the other parts of this desert, is absolutely wanting in irrigation; even wells are fewer than in the tract south of the Hurku; yet such as there are, the nomads depend entirely for their supply of water in summer on them, and on the temporary lakes formed after heavy rains, and retained on the surface of the hard clay, while in winter they satisfy their wants with snow, removing at that season to pastures which have been left untouched during summer on account of the absence of water.

The population of the Central Gobi, as in general throughout the Khalka country, is numerous and well to do. Enormous flocks of sheep roam near the encampments; camels, horses, and horned cattle in smaller numbers. Towards the end of summer all these animals become remarkably fat, a surprising circumstance if the scanty pasturage be considered. I think their good condition is mainly attributable to the freedom they enjoy, and also to the absence of insects, which are such a grievous torment in the more fertile districts.[1]

On crossing the frontier of the Khalka country we entered the principality of Tushetu-khan, and hastened by forced marches to Urga, which was now the goal we were so desirous of reaching. Nearly three years of wanderings, attended by every kind of privation and hardship, had so worn us out physically and morally that we felt most anxious for a speedy termination of our journey; besides which, we were now travelling through the wildest part of the Gobi, where want of water, heat, storms of wind, in short every adverse condition, combined against us, and day by day undermined what little of our strength remained.

I need only describe the water we had to drink after crossing the Hurku hills, to give some idea of our discomforts. Shortly before we passed through this country a heavy fall of rain had choked up most of the wells and had formed temporary lakes, by the side of which Mongols were as usual encamped: some of these lakes were but a hundred yards across and two or three feet deep, yet a dozen or more yurtas would often be seen pitched by them, and their brackish water was rendered muddy and filthy in the extreme by the large herds daily driven to drink in it, the heat of the sun raising its temperature to 77°. The first sight of this water was enough to disgust anyone; but we, like the Mongols, were obliged to use it, taking care to boil it first and to add *brick-tea*.

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[1] Tsaidam is an instance of this; there cattle grow thin on good pasturage, only recovering in winter when they are relieved from their tormentors.

The mirage, that evil genius of the desert, mocked us almost daily, and conjured up such tantalising visions of tremulous water that even the rocks of the neighbouring hills appeared as though reflected in it. Severe heat and frequent storms of wind prevented our sleeping quietly at night, much as we needed rest after the arduous day's march.

But not to us alone was the desert of Mongolia an enemy. Birds which began to make their appearance in the latter half of August suffered equally from thirst and hunger. We saw flocks of geese and ducks resting at the smallest pools, and small birds flew to our tent so exhausted with starvation as to allow us to catch them in the hand. We found several of these feathered wanderers quite dead, and in all probability numbers of them perish in their flight across the desert.

The chief migration of birds was in September,[1] and by the 13th of that month we had counted twenty-four varieties. From our observations the geese directed their flight not due south but south-east towards the northern bend of the Hoang-ho.

Eighty-seven miles north of the Hurku hills we crossed another trade route from Kuku-khoto to Uliassutai;[2] practicable for carts although the traffic is mostly on camels. Since the reinforcement of the Chinese garrison at Uliassutai after its destruction by the Dungans in 1870, the trade has considerably increased; supplies for the troops are sent this way, and Chinese merchants travel with millet and merchandise to barter with the Mongols for wool, leather, and cattle.[1]

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[1] Especially in the latter part of the month, but we had already arrived at Urga, and were therefore beyond the confines of the desert.

[2] In all probability our camels were driven off by this road in 1871, when they were stolen from us near the temple of Shireti-tsu.

Another route, a hundred miles further north, is maintained for the conveyance of mails and officials, between the two above-mentioned towns. Soon after leaving Kuku-khoto this track joins the Kalgan-Urga post road, from which it again diverges at Sair-ussu[2] in the direction of Uliassutai.

Northwards the character of the Gobi again changes, and this time for the better. The sterile desert becomes a steppe, more and more fruitful as we advance to the north. The shingle and gravel are in turn succeeded by sand mixed in small quantities with clay. The country becomes extremely undulating. The gradual slopes of low hills[3] intersect one another in every possible direction, and earn for this region the Mongol name, '*Kangai*,' i.e. hilly. This continues for upwards of a hundred miles to the north of the Uliassutai post road, when the waterless steppe touches the margin of the basin of Lake Baikal; here finally, at Hangin-daban, you find yourself among groups and ridges of rocky hills, beyond which lie the well-watered districts of Northern Mongolia.

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[1] Chinese petty traders ply a barter trade all through the summer in all parts of Mongolia, especially in the east and centre.

[2] Sair-ussu is 220 miles south-east of Urga.

[3] In this part of the Gobi the low hills are almost without rocks.

The poor pasturage of the Central Gobi now gives place to rich meadow-land, increasing in luxuriance the nearer we approach Urga. The *karmyk*, the *budarhana*, and the onion entirely disappear, and are replaced by several kinds of grasses, vetches, *Compositæ* and carnations. Animal life, too, becomes suddenly abundant. Dzerens roam over the fat pasture-lands,[1] alpine hares (*Lagomys ogotono*) and marmots (*Arctomys bobac*) bask in the sunshine, and high up in the sky soars the lark, whose familiar song we had not heard since we left Kan-su.

Water, however, is still as scarce as ever; of lakes and rivers there are none, and only an occasional spring or well, at no depth below the surface. Indeed between Ala-shan and Urga we never saw a well deeper than eight feet, and water is generally obtainable at a less depth by digging for it in the right place.[2]

As for the climate of these last months in Mongolia, I should say that the heat in July and August is equally severe, the thermometer rising to 97° Fahr. in the shade. The nights are always warm, sometimes hot,[3] and the air exceedingly dry, no dew falling. We had not a single good shower, although large clouds often gathered only to send a few drops

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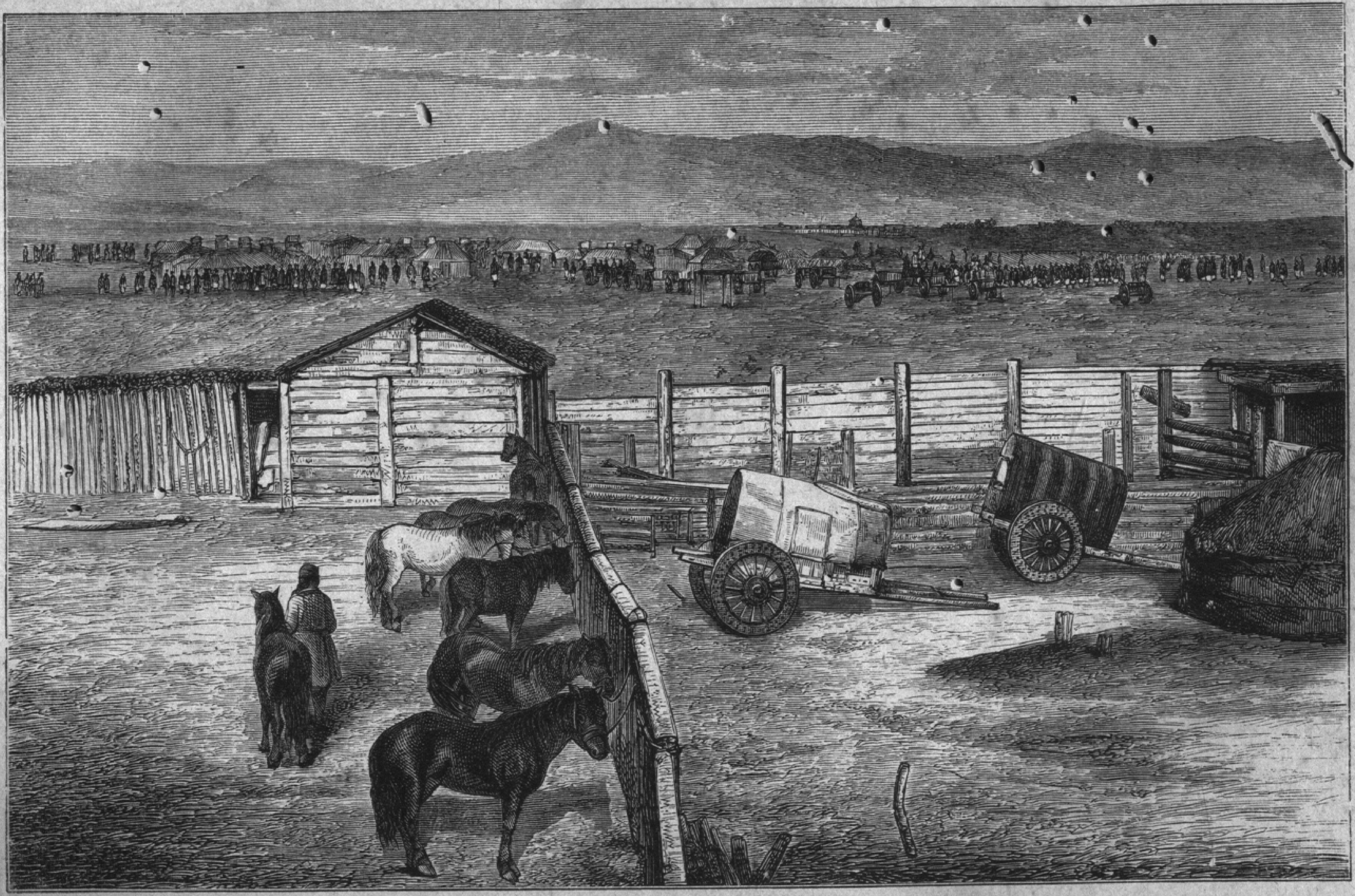
[1] We saw no dzerens in the Central Gobi, but they appear there periodically, wherever pasturage is abundant.

[2] The wells in Ala-shan are also at no great depth from the surface.

[3] Only on two occasions, viz. on August 21 and 24, the temperature at sunrise fell to 43° and 41° Fahr.



RUSSIAN MILITARY FORCE AT URGA IN THE SUMMER OF 1871.

of rain to earth. But, not long before our arrival in the Central Gobi in July, there was a terrific downpour of rain, accompanied by large hail, which destroyed numbers of cattle and some people.

In August the weather was in general clear, but the winds, which frequently blew with violence, almost invariably lasted throughout the day and night, shifting several times in the twenty-four hours; westerly winds prevailed, with a northerly and southerly variation.

The beginning of September was marked by a sudden alternation from heat to cold, for on the 8th of this month at midday the thermometer stood at 79° Fahr. in the shade, whereas the next day it blew hard from the north-west with large flakes of snow, and the mercury fell to 32° Fahr. at sunrise.

Our impatience to reach Urga kept ever increasing as we approached it, and we counted the time no longer by months or weeks but by days. At length after crossing the Hangin-daban range we arrived on the banks of the Tola, the first river we had made acquaintance with in Mongolia. For 870 miles, i.e. between Kan-su and this river, we had not seen a single stream or lake, only stagnant pools of brackish rain-water. Forests now appeared, darkening the steep slopes of the Mount Khan-ola. Under these grateful circumstances we at last accomplished our final march, and on the 17th September entered Urga, where we received a warm welcome from our Consul. I will not undertake to describe the moment when we heard again our mother-tongue, when we met again our own countrymen, and experienced once more European comforts. We enquired eagerly what was going on in the civilised world; we devoured the contents of the letters awaiting us; we gave vent to our joy like children; it was only after a few days that we came to ourselves and began to realise the luxury to which our wanderings had rendered us for so long a time strangers. The contrast between the past and the present was so great that what we had gone through appeared like a horrible dream. After resting a week at Urga, we proceeded to Kiakhta, which we reached on the 1st October 1873.

Our journey was ended. Its success had surpassed all the hopes we entertained when we crossed for the first time the borders of Mongolia. Then an uncertain future lay before us; now, as we called to mind all the difficulties and dangers we had gone through, we could not help wondering at the good fortune which had invariably attended us everywhere. Yes! in the most adverse circumstances, Fortune had been ever constant, and ensured the success of our undertaking: many a time when it hung on a thread a happy destiny rescued us, and gave us the means of accomplishing, as far as our strength would permit, the exploration of the least known and most inaccessible countries of Inner Asia.

NOTES.

THE following Note, translated from the Russian, purports to be an extract from the Diary of a Chinese Exile at Urumchi. Although this place is only incidentally mentioned in the preceding narrative, I have nevertheless thought it worth while inserting, the more so, because, from a letter lately received from Colonel Prejevalsky, I learn that his next expedition, to start in March 1876, will be directed to the Eastern Thian Shan and Kuldja, whence he will try to penetrate to Lob-nor and Northern Tibet. Urumchi would, therefore, lie so near his route that doubtless it will be visited by him.

Urumchi, or Urumtsi, the *Bish-balik* of the Middle Ages, has played an important part in history. Its advantageous position at the northern foot of a chain of the Eastern Thian Shan, dividing Dzungaria from Eastern Turkestan, always enabled it to recover rapidly from the wars which destroyed its less fortunate neighbours. Its district is fertile and its water and pasturage abundant. The first mention of Urumchi dates from the period of the establishment of the Chinese empire in the extreme north-west during the Tang dynasty (A.D. 646). Its district, with that of the neighbouring Barkul, became dependent on the government of the province of Kan-su, from which, however, it was separated by the Great Desert of Gobi.

When the Uigurs forsook their homes on the banks of the Orkhon, the Tola, and the Selenga, they settled here; and the ruins still remaining in the vicinity of the town probably date from that period. After the Mongols were driven out of China, Urumchi and the adjoining district fell into the power of the Eleuths; but about the middle of the last century it was conquered by the Manchus and became the military centre of a district extending from Barkul to Hur-kara-ussu. In 1775, Kien-long raised it to the rank of a city of the second order, and gave it the Chinese name of Ti-hwa-chau. But it was best known under its ancient name of Bish-balik, i.e. the five cities, when it flourished under the sway of the powerful Khans of the Mongol dynasty.

The streets of this town were wide and populous, and it was visited by merchants from the surrounding countries of China, Mongolia, and Turkestan. It contained a gymnasium, two temples, one school for the town and another for the district, and, according to a Russian traveller (Putimtseff), ranked, in 1811, as the richest town in Dzungaria, and was famed for its manufactures and the industry of its inhabitants. At that time it carried on an important trade with Chuguchak, on the Chinese-Siberian frontier. The mountains on the west are reported to abound in excellent coal, and at their foot lies a great plain, 100 *li* in circumference, covered with sulphurous ashes. Still further to the west, on the borders of Urumchi and Kuldja, is a great abyss 90 *li* in circumference, covered with a surface as white as snow, which becomes so hard, after rain, that if struck with a stick it gives forth a hollow sound like the Solfatara of Pozzuoli, near Naples; but neither man nor animal may venture beyond its edge without being irrecoverably lost. It is called the 'ash-pit.'

It was Humboldt (see 'Cosmos,' edited by Sabine, i. 232), who first called attention to the volcanic character of the Urumchi district; and he was followed by Ritter, who adduced the testimony of travellers to prove that severe earthquakes occurred as recently as the year 1716, and the same year (according to Falk) the town of Aksu was almost entirely destroyed by a similar cause. Severtsoff denies the volcanic character of the Western Thian Shan where [illegible] him; but as no travellers have, as far as I am aware, recently explored its eastern chains, the whole subject requires further investigation. The following is the translation:—

The name Urumtsi or Urumchi is the Dzungarian for a wood suitable for a battue. Its official name, as the central place of administration for convict settlements, is Ti-hwa-chau, but it is better known in the commercial world by the name of Hung-miau-tsz, i.e. 'red temple,' after a pagoda outside the town painted red. Urumchi is situated at the foot of a western spur of the Bogdo-ula, whose triple peak is visible some distance off, and in whose honour sacrifices are annually offered up from a hill in the immediate vicinity of the town.

Urumchi consists of two parts: the old, or commercial, situated on the right bank of the river, on the slope of the mountain; and the new or Manchu town, placed on low ground near some springs.

The climate is severe, less so, however, since it has been inhabited by a settled population. Rain falls very rarely, not oftener than once or twice a year, and some years not even that, but snow falls in quantities, and lies so thickly on the ground as sometimes to block the communications. The inhabitants supply themselves with water from the streams issuing from the mountains fed by the melting snows; and from wells, which are easily dug owing to the vertical disposition of the strata. The fields are artificially irrigated. Near the town are some hot sulphur springs.

The district of Urumchi extends westward along a valley watered by the streams flowing from the Thian Shan mountains and afterwards discharging into a great marsh, whence there is no outflow. This is called *Veh-i-hu* or *Veh-i-tan*, i.e. the 'reed marsh.' It is overgrown with reeds, and is several hundred *li* in extent from east to west, forming a barrier to the north of the district. What there is to the north of this again no one can say, for nobody ever set foot there. Popular superstition has it that this is the breeding ground of the locust, although this insect has never been seen at Urumchi. The peculiarity in the physical formation of the country favours the presumption of the existence of an extensive depression on the northern side of the Thian Shan, like that of Lob-nor on the south.

Within the district ruined sites of towns and traces of ancient cultivated fields may be seen, evidencing ancient settlements in this country; of especial interest are the ruins near the Himus station, probably dating as far back as the Tang dynasty, and here is preserved a large stone image of Buddha, half buried in the earth; carbonized objects found here prove, in the opinion of the author of these Notes, that this ancient city was destroyed by fire.

The population of Urumchi consists of Chinese settlers who have lived here for so many generations that they may be regarded as its original inhabitants. When the Manchus conquered Dzungaria they were desirous of consolidating their empire in this remote country, and accordingly drew up a broad scheme of colonization, in accordance with which they planted military colonies of their own dynastic subjects (Manchus, Sibos, Dahurs, Solones, Chakhars, and Eleuths), with their wives and families and a few native Chinese; further, they encouraged voluntary emigration from China, supplying the colonists with money, provisions, and agricultural implements, and granting them arable land. In other ways, too, they endeavoured to increase the settled population in the nomadic districts.[1]

The military, stationed at Urumchi, consist of Manchus and native Chinese, some of the former being obligatory agriculturists, *Tsi-ho*, i.e. bannermen or Manchus; the latter, free agriculturists or simply *Bing-hu*, i.e. military.

The common people are divided into several classes: 1. Those who have voluntarily emigrated from China at the invitation of government, *Nim-pu*. 2. Merchants desirous of becoming agriculturists, who have inscribed themselves among the inhabitants of the town, *Shang-hu.* 3. Chinese vagrants who have been colonized here, *An-cha-hu*. 4. Exiles, including those whose term of banishment has expired, and who have joined the class of agriculturists, *Tsian-hu.* Each class forms a separate commune with an elder, called *Tou-mu*, or *Siang-yu*, to whom reference is made in cases of official interference, whence their authority is very great.

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[1] About this time a colony of settlers from the towns of Turkestan, called by the Eleuths *Tariachi* (*Taranchi*), or colonists, was established near Ili.

Besides the classes we have enumerated, there are the gardeners, *Yuan-hu*, who hire land from government; but as they do not form part of the regular population, they are not included among the natives. The tradesmen and operatives mostly belong to the class of exiles, and these also supply servants for the townspeople.

The colonists do not live in villages but in detached farms, each on his own land. They never fertilise the soil with manure, but sow their crops in regular rotation. Owing to the depth to which the ground is frozen in winter no corn is sown in autumn but all in spring. Those colonists who belong to the class of exiles return to Urumchi after the harvest is over, and engage in other occupations, repairing to their fields again in spring for the sowing. The merchants often buy the growing crops of the peasants, paying for them as they come up and afterwards gathering them themselves.

Wheat and oats are chiefly cultivated at a place called *Gau-tai*; rice is also sown, but what kind of rice, the dry or the watery, the author does not mention. Oats are used for feeding cattle and distilling brandy. Oatmeal also serves the inhabitants for food. Of the vegetables produced by the gardeners, the author praises the cabbage and turnip in particular. Two kinds of poppy are also cultivated. But in its fruit and all the other produce of its soil, this country is far behind the neighbouring Turkestan.[1] The tobacco cultivated at Urumchi is said to be excellent. Asafœtida and madder are also among its productions, the latter superior to the Chinese kind, but hitherto unused; its root ground into powder is an antidote to the bite of the phalangium.[1]

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[1] This is of course Eastern Turkestan, or Kashgaria, and must not be confounded with Russian Turkestan to the west of the Pamir.

The natural wealth of the Urumchi district is considerable. In the mountains south of Manas alluvial gold is found everywhere. The iron works near Urumchi are supported by government; the ore, however, only yields 13 per cent. of metal. Saltpetre is obtained at Yanbalgasun, and several thousand pounds of it are annually sent to the gunpowder manufactories at Ili and Tarbagatai. The talc found here is of excellent quality, and serves the inhabitants instead of glass. The mountains near Urumchi yield an abundance of excellent coal of different qualities; the best being found in the northern mountains; this burns without smell or smoke, is easily lighted, not quickly extinguishable, and leaves a perfectly-white ash. The coal from the mountains west of the town is suitable for the kitchen and burns to a red ash; besides these there are two inferior qualities of mineral coal. The best charcoal is prepared from a tree called the *soso*; if fired in the evening, it will burn all night; the wood of this tree is very hard, but its root does not penetrate deep into the ground.

Salt is obtained in the lakes and is of a dark colour; red salt is brought from Turfan.

Urumchi, like Hami, is a great *entrepôt* for trade as well as for the transport and storage of merchandise. It has communications with China (viâ Hami), Turfan, Ili, and Tarbagatai, besides a direct road across the desert to Kuku-khoto, frequented by merchants. The merchants live in the suburbs of the old town in separate communities. Thus there are communities of Suh-chau, Lan-chau, and Kuku-khoto merchants, the latter known at Urumchi as 'guests from the Trans-Ordos country' (*Peh-tau-keh*), are the richest; they are natives of the province of Shan-si, and by their superior enterprise have monopolised most of the Central Asian trade. There is also a community of Mongol merchants and Turkestan traders come from Turfan. The author gives no details concerning the trade, merely remarking that the local consumption of tobacco and brandy is enormous.

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[1] This may be the venomous spider of Eastern Turkestan described by Timkowski (i. 405). Its bite was said to cause death if remedies were not immediately applied. Miàneh, in Persia, near Tabriz, is also celebrated for a venomous kind of white bug, which is said to be

We have omitted, for the sake of brevity, the author's remarks on the peculiarities of the Urumchi country, its wonderful boars, and its snakes with tails so stumpy as to have the appearance of having been cut off. We also readily omit his sketch of the manners and morals of the inhabitants and the dissipated lives led there by the foreign merchants; he observes, amongst other things, how easily the Chinese merchants accustom themselves to the gay life at Urumchi and forget their homes; and how it frequently happens that the families of such persons petition government to take measures to oblige their relatives to return, and that in consequence these are summarily arrested and sent back to China under escort.

THE RHUBARB PLANT.

P. 81.

The following Note is a translation of an article which appeared in Regel's 'Garten Flora' (January 1875), from the pen of Professor Maximovitch, of St. Petersburg, who is at present engaged in preparing for publication the botanical results of Colonel Prejevalsky's expedition, and to whose kindness I am also indebted for the illustration of the Rhubarb plant on page 82 of this volume.

By way of introduction, I give an extract from 'Purchas, his Pilgrimage,' 'a collection of travels in all parts of the world,' published in London in 1617:—

'In the same province of Tanguth is Succuir,[1] whose mountains are clothed with rheubarbe, from whence it is by marchants conveyed through the world. Campion[1] is the mother citie of the countrey, inhabited by Idolaters, with some of the Arabian and Christian nations. . . . .

'Succuir also is, according to his report,[2] 'great and faire, beautified with many temples. Their Rheubarbe they would not bestow the paines to gather, but for the marchants which from China, Persia, and other places, fetch it from them at a cheap price. Nor doe they in Tanguth use it for Phisick, as wee heere, but with other ingredients make perfumes thereof for their Idols; and in some places they burn it instead of other firing, and give it their horses to eat. They set more price by an hearbe which they call *membroni cini*, medicinable for the eyes,[3] and another called *Chiai Catai*, growing in Catay, at Cacianfu,[4] admirable against very many diseases, an ounce whereof they esteem as good as a sack of Rheubarbe; whose description you may see at large, according to the relation and picture of the said *Chaggi* in *Ramusius*; for (to add that also) they have many painters, and one countrey inhabited onely by them. These Tanguthians are bearded as men in these parts, especially some time of the yeere.'

RHEUM PALMATUM L. THE GENUINE RHUBARB.

Although the accounts of the true Chinese Rhubarb, collected from various travellers and writers, agree wonderfully with one another as to its native land, station, gathering, preparation, and principal place of trade; all pointing unanimously to Kan-su, the country of the Tangutans, and north-westernmost province of China Proper; still the only Europeans who had hitherto seen the genuine

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[1] i.e. Kan-chau.

Kan-su itself is a name compounded of the two cities of *Kan*-chau and *Suh*-chau (Yule's 'Marco Polo,' 2d. ed. i. 222.)

[2] i.e. Hajji Mahomed's, the Persian traveller in Ramusio's 'Navigationi.'

[3] An account of this drug *mamira* was given by the late Daniel Hanbury in the 'Pharmaceutical Journal,' some six or seven years ago.

[4] Probably Kenianfu, i.e. Singanfu, the capital of Shen-si, though

Rhubarb in its native land, were Marco Polo and the Jesuits, who travelled through China and surveyed it, at the end of the seventeenth and beginning of the eighteenth century, by order of the government. But as they neither brought to Europe a scientific description of the plant, nor the plant itself, nor even seed, the genuine Rhubarb ever remained unknown. At the beginning of the last century the Russian Government prepared at Kiakhta, on the Siberian-Chinese frontier, a Rhubarb-'Brack,' where all the Rhubarb imported from China was subjected to a compulsory and strict examination previous to being admitted to the European market, in consequence of which that received through Russia, and called the Muscovite Rhubarb, was universally considered the best. The officers stationed at this 'Brack,' endeavoured in the discharge of their office to obtain fresh seed of the genuine Rhubarb through the Chinese Rhubarb importers. The jealousy of the Chinese, who would not allow so valuable a plant to leave their land, rendered this attempt at first unsuccessful. A few seeds were certainly obtained in 1740, at a high price, propagated in European gardens, and the plants raised from them considered for some time to be genuine, and even described by Linnæus under the name, *Rheum Rhabarbarum*; but this soon proved to be nothing more than the *Rhapontik R.*, which also grew in Siberia, and Linnæus accordingly altered his hastily-given name to *R. undulatum.* But about the year 1750, fresh seed was obtained from which the genuine *R. palmatum,* never before seen, was propagated. In this way, thanks to the exertions of Russia, Europe acquired the genuine Rhubarb plant; its cultivation developed rapidly, and in the eightieth year of the last century it was widely diffused through Scotland, England, and Germany; indeed, in the two first-mentioned of these countries, where the Horticultural societies in every way encouraged its culture and preparation, the root had already become an article of trade, and was found by many doctors fully equal to the Chinese in operation, and was exclusively used in practice. It was found, however, after numerous experiments, that no roots under eight years' growth furnished a good drug; and that, even with these, much depended on the time of gathering, the after-treatment, and especially the drying; further, it appeared that only the parent root and not the branches furnished the strongest medicine; but as the former was liable to decay, the cultivation was difficult. Such were among the principal causes which combined to disappoint the expectations which had been formed of the garden rhubarb. An opinion, moreover, gained ground among merchants as well as among physicians, that the Chinese quality was superior. Nevertheless *R. palmatum* would have gradually made its way, had not doubts of its being the parent plant of the genuine Rhubarb soon been expressed direct from Russia. Pallas showed the Chinese in Kiakhta dried specimens of *R. palmatum*, and believed their assurances that this was not the true plant, but that it was smaller, and had an undivided leaf, besides other falsehoods.

Sievers, who travelled, between 1791–1795, along the whole Siberian-Chinese frontier, by order of the Russian Government, to study the Rhubarb question, also heard a confirmation of the same story from the Chinese in Kiakhta. Relying on these statements, they asserted that the original plant of the genuine Rhubarb was still unknown. This, doubtless, gave a severe blow to the cultivation of *R. palmatum*; and as another Indian species (*R. australe*) was about this time introduced into England, which appeared to answer better to the Chinese description, everyone turned their attention to it, and *R. palmatum* gradually disappeared from our gardens. It was soon evident that *R. australe* furnished but a bad root, and many authorities, especially Guibourt, were firm in their support of the *R. palmatum* as the only kind which at all equalled in appearance and property the genuine Chinese root; but the mischief was done and could not be easily repaired, for though the interest was still as great as ever, it had become extremely difficult to procure a fresh supply of plants.

It was reserved for Lieut.-Col. Prejevalsky to decide finally the *vexata quæstio* of the parent plant of the

Kiakhta or Kan-su Rhubarb in favour of the *R. palmatum L.*, he himself having gathered in Kan-su and brought a quantity of good seed to the Botanical Gardens at St. Petersburg. To the communication of Colonel Prejevalsky, (see *supra*, vol. ii. p. 82) I may add, says Professor Maximovitch, that the dried roots (about 36 lbs.) brought home by this traveller, after having been carefully analyzed and tested by our chemists and physicians, entirely agreed with the best Kiakhta Rhubarb both in internal structure as well as in the number of the crystals of oxalate of lime, the quantity of extract obtained from the root, and in the medicinal effect of the powder and other preparations. The only apparent difference between them was, that not having been subjected to a second cleaning and sorting process, small layers of rind still adhered to these samples, and the holes through which the string had passed by which they had been suspended to dry, were of smaller diameter than those of the Kiakhta Rhubarb, in which all the rind was carefully scraped off and the holes enlarged in order to remove all discoloured or bad pieces. The rules for the cultivation of Rhubarb (*R. palmatum L.*), are as follow:—Plant in light, loose black soil, in a shady situation, and not exposed to the south; leave sufficient space for each plant to develope itself (8 feet), water regularly, for it must be borne in mind that the climate of Kan-su is damp. Moreover, I think it necessary to call attention to two other conditions.

According to an analysis of the (salt) water of Koko-nor, made by Professor Schmidt of Dorpat, from samples brought by Colonel Prejevalsky, it was found to be much richer in salts of lime than other salt water; and this property Professor Schmidt attributes to the lime contained in the sweet waters which fall into the lake. But since the medicinal value of the root increases in proportion with the greater quantity of crystals of oxalate of lime contained in it, and a good root is immediately ascertained if it grate between the teeth on being chewed, it follows that hard (lime-containing) water is essential to its successful cultiva-

-tion, for it supplies the plant with the lime requisite for the formation of crystals. Perhaps, it was entirely owing to the absence of these requisite conditions, that the root of the *R. palmatum*, as formerly cultivated in Europe, did not grate between the teeth, and was less powerful in operation than the Chinese Rhubarb of commerce, which it resembled in every other respect.

Another important circumstance is, that the principal root becomes so rotten under cultivation, that the less valuable lateral branches are alone retained for use; whereas, the pieces cut from the main root are by far the most prized. Rain-water accumulates in the cavities formed by the breaking off and decaying of the flower stalks, from which it is prevented from running off by the numerous old leaf sheaths which remain round the *hilum*, or eye, and in this way causes an ever-deepening and spreading decay. How this can best be prevented must be left to further experiments to determine; the remedies which appear to be most practical are: cutting away the old leaf sheaths and withered stalks before they have had time to decay at the root, and covering or stopping the eye of the stalk. Perhaps, it would be best not to allow the plants, in general, to bloom. Nearly all our larger kinds of Rhubarb, not excepting the *R. palmatum*, show in almost every joint of their root-leaves and of the old *stipules* numerous embryo buds, of which only the smallest come to maturity, because the plants must develop their flower-stalks. But, whilst old plants hardly ever throw out more than three flower-stalks, and their principal roots have seldom more than four or five root-heads, each of which has a corresponding stalk, or would have, were it not for the obstructing formation of the stem, which causes them to throw out numerous buds, these not only add more quickly to the size of the root but also form a number of shoots. Now it is just this which causes the marbled appearance with the irregular stellated spots in the *parenchyma*, and the more this is encouraged, so much the more will that valued structure thrive, which, as is well known, quite does away with the side branches of the root. This difficulty in the cultivation of the *Rheum palmatum* induces me to say a few words of a newer importation—the *Rheum officinale.*

When the importation through Kiakhta ceased, the 'Brack' there was useless, and, therefore, done away with; and the Muscovite—the best Rhubarb—entirely disappeared from the market. Henceforward, the Rhubarb was shipped from the Chinese ports to Europe; and, owing to the absence of a 'Brack,' every commodity, good, bad, or indifferent, found purchasers. The consequence was, that a quantity of inferior, decayed, or badly dried roots, with an admixture of thin pieces cut from the lateral shoots, were introduced into the trade. The quantity of Kan-su Rhubarb likewise diminished in consequence of the disturbed state of that province. But, inasmuch as the need of a good article continued as great as ever, and the demand remained firm, new countries began interesting themselves in its production, and a new and excellent species from the southern provinces of China made its appearance in the markets of Europe. In 1867, the French Consul at Hankau (on the Yang-tse-kiang), M. Dabry, obtained through the Chinese several growing roots of this good Rhubarb, and these he forwarded to Paris, where they arrived certainly in a very bad condition, notwithstanding which, one plant was raised, which blossomed in 1871, and was described by Baillon under the name of *Rheum officinale.*

This plant exhibited a striking contrast to all kinds of Rheum, in that it formed ramified stalks above ground, a foot long and of great thickness, and as no water can accumulate upon it, it is easily preserved from harm. Baillon considered it an inhabitant of Eastern Tibet, and the only genuine parent-plant of the best Chinese Rhubarb; and Flückiger and Hanbury, as we have seen, hastily accepted it as such.

It is very possible that we may have in this new species a plant which may take the place of the old and less easily cultivated *R. palmatum.* But I cannot help remarking, that every *Rheum* hitherto introduced among us, as a medicinal plant (even *R. undulatum* and *R. compactum*), at first answered admirably, but soon afterwards deteriorated. It remains then to await the issue of the further cultivation of this species hitherto propagated in but a few gardens, and in single specimens. But even admitting that we now possess two kinds which furnish excellent Rhubarb, the preference must still be given to *R. palmatum*, since its genuineness as the parent plant of the Kiakhta Rhubarb has now been established beyond all doubt, seeing that its fame dates back to the times of the Grecian and Arabian doctors, and that its earlier cultivators have decided, that, with careful treatment, its root affords an admirable drug. Let us hold firmly to *R. palmatum*, and take care that its wholesale cultivation does not die out, now that a quantity of freshly imported seed renders it once more practicable. Should the *R. officinale* prove to be an equally valuable production, we have the choice between the two, unless it be found that one plant thrives better in a different climate to the other. As ornamental plants, both have certainly a future.

THE MANUL (FELIS MANUL OF PALLAS).

P. 187.

This species is intermediate between the cats and the lynxes, but its tail is much longer than that of the lynx and its ears are not pencillated. It is said to possess one tearing tooth fewer than the typical cats; but still it belongs to the genus Felis. In its general habits it differs from all its congeners, being found in bleak and exposed places, generally among rocks, where it seeks its food by chase rather than by stratagem. That food consists chiefly of hares and other rodent animals; but, true to the habits of the genus, it preys during the night. It does not climb trees or enter forests, and, according to all the accounts we have of it, it differs greatly from the rest of the genus. It combines with the characters of the cats and lynxes some at least of the habits of the fox.[1]

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[1] 'British Cyclopædia.'

SUPPLEMENTARY NOTES.

THE TALDI.

P. 69–70.

IT is obvious that the passage of Palladius which Mr. Morgan has translated in the footnotes bears no very clear reference to the *Taldi* of Col. Prejevalsky. Mr. Ney Elias remarks on his account of them as follows:—

'The description of these people, as also the locality in which they occur, corresponds closely with Huc's account of the race he calls *Dchiahours.* The name of *Dalde*[1] may certainly have suffered in copying or printing, but I can find no approximation to it in any work treating of Western China; nor, with the exception of Huc's, it must be added, of the *Dchiahours* either. The only specimen of *Dchiahours* that I am personally acquainted with is Huc's old servant "Samdadchiemba," who certainly, as regards language, corresponds to Prejevalsky's description of the *Daldes.*'[2]

I transcribe Huc's account, referred to by Mr. Elias: 'The Dchiahours . . . . occupy the country commonly called *San-tchouan*—"Three Valleys,"—the native district of our camel-driver Samdadchiemba. The Dchiahours have all the rascality and craft of the Chinaman without his civility and polished language; so they are feared and detested by all their neighbours. When they fancy their rights infringed on it is always with the dagger that they seek redress. Among them the man held in most honour is always the one who has committed most murders. They speak a language of their own, which is a medley of Mongol, Chinese, and East-Tibetan. By their own account they are of Tartar origin; and if it be so it may be said that they have exceedingly well preserved the savage and independent character of their forefathers, whilst the manners *of the present* people of Mongolia have been singularly modified and softened.

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[1] So it is written in Col. Prejevalsky's original letters as published

'Although subject to the Emperor of China, the Dchiahours are under the immediate government of a kind of hereditary sovereign belonging to their own tribe, and bearing the title of *Tou-ssé*.'[1]—[Y.]

SILING AND TONKIR.

Pp. 107 and 119.

What the footnote at p. 107 refers to is this:—

Certain textures of shawl-wool, or resembling it, are imported from the eastward into Kashmír and Ladák under the name of *S'ling*. And certain other manufactures were found by Mr. R. B. Shaw in the markets of Kashgar, which were stated to come from a region called *Zilm*. Knowing from P. della Penna, and other sources, that Sining-fu was called by the Tibetans *Ziling* or *Jiling*, and by the Mongols *Seling Khoto*, it seemed to me almost certain that both the *S'ling* of Ladák and the *Zilm* of Kashgar, referred to the same place. Mr. Shaw doubted, from the particulars given him, if Zilm could be so far east; but I see by a recent letter that he now accepts the identity.[2]

In the footnote at p. 119, it is indicated that the Tonkir of the Russian traveller is Huc's *Tang-keu-eul*. The latter calls it 'a small city, but very populous, and with very great trade. It is a regular Babel' (ii. 54). The place is mentioned in P. Orazio della Penna's account of Tibet as *Tongor* (*J. Asiat.* 2nd S. xiv. 195). And in the Chinese 'Itinerary' already quoted, we find under the first march out of Sining-fu: 'Between this and Sining there is a large lamasery, *Denger*. In (1727) this became a trade-centre for all the Mongols west of the Hoang-ho.'—[Y.]

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[1] ii. 35-36.

[2] In the *Philos. Transactions*, vol. lxvii. pt. ii. p. 482, in a letter from Mr. Stewart to Sir John Pringle, regarding Bogle's mission, dated March 20, 1777, mention is made of *Seling*, as a place to which the caravans traded. It is also probably the place 'on the river

THE KYANG AND THE KULAN.

P. 146.

Some naturalists have distinguished between the *Kulan* of West Turkestan, and the *Kyang* (or *Djiggetai* of Pallas) of Tibet and Mongolia. But it appears from the text that the *Kulan* of the Turki-speaking people of Central Asia is the same as the *Kyang* of the Tibetans, and of our Trans-himalayan sportsmen. And this is confirmed by a passage in Dr. Bellew's 'Kashmir and Kashgar' (p. 400), from which it appears that a place on the Yañghi Dábán Road is called *Kulan Uldi*, 'The wild horse (ass?) died.' Now I believe there is certainly only one species in the Trans himalayan region; indeed, I see in another place Dr. Bellew says: 'We came upon a herd of six or seven *kyang* or *culan*' (p. 182).—[Y.]

THE TANGUTANS.

P. 109.

Tangut was a kingdom well known by that name in the Middle Ages, and nearly corresponded to modern Kansuh in a general way. Indeed Kansuh was, under the Mongol Emperors (1260–1368) the official Chinese name of the region known to the Mongols and Western Asiatics as Tangut. It was, however, in the Middle Ages also called *Ho-si*, 'Country west of the (Yellow) River;' and in a Perso-Chinese Dictionary, made about A.D. 1400, *Tangut* is explained by *Ho-si*. The bulk of the inhabitants were of Tibetan blood, and the capital was at Ning-hia, on the

Yellow River. The country was several times overrun by Chinghiz-Khan, and on the last occasion (1227) he died in this country. The name is still, we see, in use among the Mongols, but it seems often to be applied to the whole of Tibet. There is something requiring further elucidation about this double application of the name. The Tangutans of Prejevalsky are those Eastern Tibetans who are called by the Chinese *Si-fan*, or 'Western Barbarians.' They inhabit the district of Koko-nor, and extend also along the western borders of Szechwan.[1]

The Sifan are divided in the Chinese accounts of the frontier states into Black Sifan (probably the *Kara-Tangut* of Prejevalsky) and Yellow Sifan; the former being derived from their custom of using tents made of black yak-hair cloth. The Yellow are stated always to have a prince at their head who becomes a cleric and wears the yellow robe. *Sifan* seems, undoubtedly, often to be employed in Chinese for people of the Tibetan race generally; and I suspect these Yellow Sifan are simply the Tibetans of Tibet, under the Grand Lama, whilst the Black Sifan are the nomadic people of Tangut.

The language of the vocabulary given by Prejevalsky at pp. 136–138 is evidently Tibetan. And this agrees with what is said in the Chinese papers translated by Grosier: 'The language of Tibet is almost the same as that of the people called Sifan, and differs only in the meaning attached to certain words, and in some peculiarities of pronunciation.'[2]

The difficulties of Tibetan spelling, and other uncertainties of transcription by ear, render it hard for anyone but an expert to make a thorough comparison. But the following examples will show that the language is Tibetan:—

---

[1] Kovalefsky gives '*Tanghout*; Ch. Sifan . . . . pays situé au nord et à l'occident de Chen-si province chinoise;' but also '*Tanghout-tchi*, connaisseur de la langue Tangoutaine (*tibétaine*).' Della Penna speaks of *Tibet* as being called 'Kingdom of Tangut.'

[2] *Desc. Gén. de la Chine*; 1785. 4to. pp. 150–152.

English.	Prejevalsky's Vocabulary of Tangutan.	Tibetan.[1]
Mountain	*Rī*	*Ri*
Lake	*Tsō*	*Thso*
Water	*Chsiu*	*Ch'hu*
Grass	*Rtsa*	*Tsa*
Fire	*Mī*	*Me*
Rain	*Tsiar*	*Char-bba*
Lightning	*Tok*	—
Thunder	—	*Tog*
Heat	*Tsa-tchigeh*	*Cha*
Wind	*Lung*	gn*Lung*
Road	*Lam*	*Lam*
Butter	*Marr*	*Mar*
Meat	*Shā*	*Jsha*
Sheep	*Liuk*	*Lug*
Fox	*Gā*	*Kwa*
Camel	*Namung*	r*Ha-mong*
Tobacco	*Do-wa*	—
Smoke	—	*Du-wa*
Ears	*Rna*	r*Na-wa*
	etc. etc.	

Numerals.

——	Prejevalsky's Tangutan.	Jaeschke's Tibetan.
1	Khtsik	chig
2	Ni	nyi (s)
3	Sum	sum
4	Bjeh	zhi
5	Rna	nga
6	Chok	dhug dshug[2]
7	Diun	dun
8	Dziat	gyad
9	Rgiu	gu, rgu[2]
10	Tsiu-tamba	chu, or chu-tham-pa

It may be noted that both Black and Yellow Sifan appear to have been visited by Friar Odoric as early as 1326 or thereabouts. He says, in quitting *Kansan*, i.e. Kenjan-fu or Shensi: 'I came to a great kingdom called

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[1] Partly from Jaeschke's *Romanized Tibetan and English Dict.*, Kyelang in Lahoul, 1866; partly from Klaproth's *Asia Polyglotta.*

[2] *Asia Polyglotta.*

TIBET, which is on the confines of India Proper, and is subject to the Great Khan. They have in it great plenty of bread and wine as anywhere in the world. The folk of that country dwell in tents made of black felt. But the chief and royal city is all built with walls of black and white, and all its streets are very well paved. In this city no one shall dare to shed the blood of any, whether man or beast, for the reverence they bear to a certain idol which is there worshipped. In that city dwelleth the *Abassi*, i.e. in their tongue, the Pope, who is head of all the idolaters, and who has the disposal of all their benefices, such as they are, after their manner.' This is very curious, as showing that there was a Grand Lama (at Lhassa ?) recognised as Pope of Lamaism many years before the period assigned to the establishment of the spiritual dynasty of the Dalai Lama as now existing.—[Y].

THE DUNGANS.

P. 122.

There is no need to add to what has been written about these *Tungani*, whom Russian ears apparently transform into *Dungans*. The name does no seem to be applied in any sense of race, but simply to be the popular name by which *Chinese Mahommedans* are known among the Turki-speaking people of Central Asia, and on the Russian frontier.

The earliest mention of it that I have met with is in 'Izzat Ullah's 'Itineraries,' published in the seventh volume of the 'Journal of the Royal Asiatic Society' (p. 310). The name also occurs thus in Burnes:—

'These soldiers (of the Chinese garrisons in Kashgar) are drawn from the tribe of Toonganee, who claim relationship to the army of Alexander; they are Mahommedans from the adjacent provinces, but dress as Chinese.'[1]

And in Mr. Wathen's 'Notes on Chinese Tartary,' derived from certain pilgrims who passed through Bombay to Mecca in 1835, we find the following:—

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[1] *Travels to Bokhara*, 1834; ii. 229.

'The Tuñgani live in the country, the chief towns of which are Salar and Sairam. Alexander the Great is said to have penetrated as far as Salar, and to have left a colony of his soldiers in the country, from whom the *Tunganis* are descended. They derive the name from several Turkish and Persian words signifying "left behind," "looking back," &c.'[1] This shows how old is the question of the obscure etymology of the name. The most probable seems to be that assigned by Vámbéry, from a Turki word signifying 'a convert.'—[Y.]

RED AND YELLOW LAMAS.

P. 151.

Col. Prejevalsky's definition of the radical difference between these would better have been described as *loose* than as 'not to be relied on.' Some notion of the distinction may be obtained by reading what is said about Tsong-kaba's reform of Lamaism, in the Introduction. Marriage of the clergy was admitted by the Red, or unreformed, Lamas in some cases, and under some restrictions. But it does not appear that it is by any means a general or present characteristic of them. Ladak, Bhutan, and Sikkim are nurseries of the Red Sect, since the predominance of the Yellow in Tibet Proper.—[Y.]

DIFFICULTY AS TO FIRES AT GREAT ALTITUDES.

P. 183.

Marco Polo notices this in his account of Pamir; and a note on that passage (2nd ed. i. p. 187) gives some remarks on the subject by Humboldt, and some of the experience of my friend Col. Montgomerie, R.E.—[Y.]

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[1] *Journ. As. Soc. Bengal*, iv. 655.

THE MURUI-USSU, THE TIBETAN SOURCE OF THE YANGTSE-KIANG.

P. 221.

The Chinese seem generally to regard the River Min, which flows through the city of Chingtu-fu, and joins the Yangtse at that of Siu-chau-fu, as the true river. But there is no question that the river which comes from Tibet is much the longer, and probably little question that it is also much the larger. The Dutchman, Samuel Van de Putte, who travelled from Lhassa to Peking in the earlier part of last century, wrote to the Italian priests at Lhassa, that when crossing the river upon that journey he started in a boat of hide one morning, passed the night upon a small island in the river, and did not achieve the completion of the passage till the middle of the following day.[1]

The 'Tangutan' name given as *Di-chu* in the text should probably be *Bi-chu*. *Bi-tsiu*, or *Bhri-tsiu*, 'the River of the Yak-cow,' is the Tibetan name, and this is almost certainly the origin of the name *Brius*, that Marco Polo gives to the river. The Mongol name *Murui-ussu* means, not 'River-water,' as the author says, but 'Winding River.' The Chinese name down to Siu-chau is Kinsha-Kiang or *Gold-sand River*.—[Y.]

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[1] *Journ. Asiatique*, 2nd series, xiv. 191–192. A curious notice of this Dutch traveller has just appeared in Mr. Markham's work upon Tibet.

TABLE OF
COLONEL PREJEVALSKY'S OBSERVATIONS,

Worked out by Fritsche, Director of the Russian Observatory at Peking.

—	North Lat.	Long. East of Greenwich	Date	Magnetic declination	Horizontal intensity; absolute measurement	Height above sea in feet
Peking	39° 56′ 8″	116° 28′ 6″				121
Ku-peh-kau	40° 41′ 7″	117° 8′ 6″	March 12, 1871			692
Fu-ning-hien	41° 22′ 0″	117° 5′ 3″	,, 18, ,,			2,059
24 miles 1,480 yards SE. of Lama-miau on the Luan-ho						3,890
Town of Lama-miau (Dolon-nor)	42° 16′ 6″	116° 19′ 0″	,, 28, ,,			3,985
Dalai-nor lake	43° 18′ 0″	116° 58′ 0″	April 6, ,,			4,168
Road on the plateau from Lama-miau to Kalgan						4,592
Pass 12 miles 740 yards NNW. of Kalgan						5,356
Kalgan	40° 50′ 7″	114° 53′ 1″				2,709
Suma-hada range, plain between the mountains	41° 27′ 7″	112° 0′ 0″	June 6, ,,	+1° 50′ 5″		5,562
Munni-ula range, plain between the mountains	41° 20′ 0″	110° 0′ 0″	April 28, 1872		2,7343	5,405
Tsaideming-nor lake in Ordos, right bank of Hoang-ho	40° 20′ 7″	108° 45′ 0″	Aug. 6, 1871	+1° 11′ 0″		3,198
Shuten temple	41° 12′ 5″	106° 30′ 0″	Nov. 24, ,,	+1° 20′ 0″		3,280 ?
Bain-Tuhum temple, 7 miles 796 yards S. of the northern boundary of Ala-shan	40° 43′ 9″	106° 0′ 0″	Aug. 7, 1873			4,352
South-western boundary of Ala-shan, 10 miles 980 yards ESE. of the town of Din-yuan-ing	38° 49′ 4″	105° 50′ 0″	July 18, ,,	−1° 6′ 6″	2,9267	—
Din-yuan-ing	39° 5′ 0″	105° 46′ 0″	June 12, 1872			4,821
Tsagan-nor lake	39° 45′ 0″	105° 55′ 0″	Sept. 20, 1871			3,421
Summit of Bayan Tsumbur in Southern Ala-shan						10,646
Town of Ta-jing	37° 40′ 0″	103° 45′ 0″	June 16, 1872			5,913
Town of Ta-yi-gu	37° 30′ 0″	103° 48′ 0″	,, 20, ,,			8,606
Temple of Chobsen	37° 3′ 0″	102° 14′ 0″	Sept. 15, ,,	−0° 50′ 0″		8,921
Summit of Mount Sodi-soruksum, near Chobsen			July 21, ,,			13,579
Lake Demchuk at the foot of Mount Gadjur, near Chobsen			Aug. 10, ,,			13,074
24 miles 1,480 yards SE. of Chobsen	36° 35′ 0″	102° 35′ 0″	Sept. 29, ,,		3[illegible]392	—

COLONEL PREJEVALSKY'S OBSERVATIONS—*continued.*

—	North Lat.	Long. East of Greenwich	Date	Magnetic declination	Horizontal intensity; absolute measurement	Height above sea in feet
Si-ning-fu	36° 39′ 0″	101° 48′ 0″	—	—	—	—
Temple of Chertinton in Tatung valley	37° 15′ 0″	102° 50′ 0″	Aug. 26, 1872	. .	. .	7,235
Lake Koko-nor, south-western shore, near the mouth of the Pouhain-gol river	37° 1′ 2″	99° 18′ 0″	April 9, 1873	−2° 26′ 9″	3,0363	10,495
Pass over the southern Koko-nor range	. .	. .	March 14, 1873	. .	. .	13,517
Baian-gol river in Tsaidam	. .	. .	Nov. 28, 1872	. .	. .	8,839
Dsung-zasak, northern foot of Burkhan Buddha	36° 16′ 1′	96° 6′ 0″	Dec. 3, ,,	. .	3,0651	8,839
Pass over the Burkhan Buddha	. .	. .	,, 5, ,,	. .	. .	15,322
Highest point of this pass	. .	. .	,, 6, ,,	. .	. .	16,319
Nomokhun-gol river	. .	. .	,, 8, ,,	. .	. .	11,300
Pass over the Shuga range	. .	. .	Feb. 14, 1873	. .	. .	15,476
Lake Bouha-nor, on plateau of N. Tibet, S. of Shuga range	. .	. .	Jan. 2, ,,	. .	. .	14,373
Northern foot of Bain-kara-ula range	. .	. .	,, 12, ,,	. .	. .	14,931
Murui-ussu river (Yangtse-kiang), near the mouth of its tributary, the Napchitai-ulan-muren	34° 43′ 1″	94° 48′ 0″	,, 23, ,,	−3° 58′ 9″	3,1509	13,146
Bain-bulik spring, 2⅜ miles from Hurku range	42° 35′ 9″	106° 0′ 0″	Aug. 21, ,,	. .	. .	4,774
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Uliassutai post-road	. .	. .	Sept. 6, ,,	. .	. .	4,687
Guli spring	44° 23′ 9″	. .	,, 1, ,,	−0° 42′ 1″	—	—
Tushetu-koung Yurta	44° 50′ 0″	106° 0′ 0″	,, 3, ,,	. .	2,5461	—
Khari-nor lake	46° 51′ 5′	106° 0′ 0″	,, 13, ,,	. .	. .	4,485

According to Fritsche's Observations.

	N. Lat.	Long. E. of Greenwich	Height
Peking	39·9°	116·5°	121 feet

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